

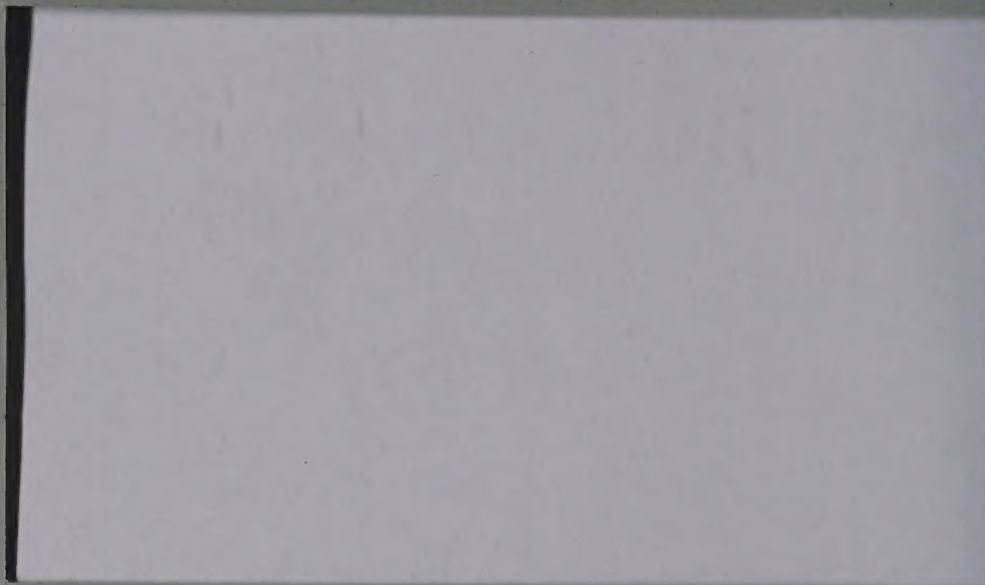
**Integrated Coastal Zone Management
in Agujitas, Costa Rica:
Planning for the
Economic, Social, and Environmental Impacts
Of Increased Growth and Development.**

by

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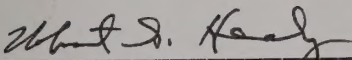
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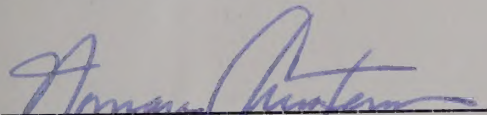
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Abstract

Costa Rica has become one of the prime tourist destinations for people from around the world who come to view the immense biological diversity that is typical of the tropics. Efforts to conserve natural resources in the country have focused on areas such as tropical rain forests, but coastal resources planning has received little attention (CEDARENA, 1992). Uncontrolled expansion of tourism, logging, and unsustainable agricultural practices threaten to spoil the attractiveness of the coast and deplete the productive potential of the region. The current law governing Costa Rica's coastlines, the Law on the Marine and Terrestrial Zone (Law 6043) has been largely ineffective in controlling for development and maintaining the integrity of the coastal zone. This is due to several factors including the limited scope of the law and lack of enforcement (CEDARENA, 1992).

This study investigates possibilities for conservation and sustainable development in Agujitas, a small coastal town in Costa Rica, through the introduction of an Integrated Coastal Zone Management program (ICZM). While still relatively pristine, Agujitas is experiencing several problems including erosion, flooding, and water quality and quantity problems due to degrading activities in the watersheds. An increase in tourism and the proposed construction of an "all season" road into the region will have additional impacts on the local people and the coastal environment. ICZM provides Costa Rica with a flexible framework to strengthen its current coastal management program and mitigate future problems. ICZM is a holistic approach, combining the bio-physical, socio-cultural, and economic aspects of the coastal zone. This approach stresses community involvement in the planning process to gain local knowledge of coastal problems and ensure long-term support for the program (Clark, 1991).

Acknowledgements

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1.0 Introduction

Costa Rica's biologically rich and diverse coastlines remain relatively undeveloped; only 5% of the nation's population resides in the coastal regions, presenting the rare opportunity for Costa Rica to manage future coastal development (Sorenson, 1990). Tourism has recently become Costa Rica's third largest earner of foreign currency, behind bananas and coffee (Mateo, 1990). However, uncontrolled expansion of tourism, logging, and unsustainable agricultural practices threaten to spoil the attractiveness of the coast and deplete the productive potential of the region. Conservation efforts in Costa Rica have focused on areas such as tropical rain forests, but coastal resource planning has received very little attention (CEDARENA, 1992).

The main objective of coastal area management is to ensure that development of an area and its natural resources is consistent with the continuing productivity and viability of the natural systems (United Nations, 1982). The current law governing Costa Rica's coastlines, the Law on the Marine and Terrestrial Zone (Law 6043), provides a good starting point for coastal management. However, due to several factors, including its limited scope and lack of enforcement, Law 6043 has largely been ineffective in controlling development and maintaining the integrity of the coastal environment. This study investigates possibilities for conservation and sustainable development in Agujitas, a small coastal town on Costa Rica's Osa Peninsula, through the introduction of an Integrated Coastal Zone Management (ICZM) program. ICZM is a holistic approach, combining the bio-physical, socio-cultural, and economic aspects of the coastal zone and stressing community involvement in the planning process.

The study addresses how past and current regulatory regimes governing the coast influence land use practices and consequent environmental problems. The trends found are used to sketch two development scenarios for the community. The first scenario, "Agujitas 1", projects what the village might be in the future based on past and present trends and case studies of similar areas. The second scenario, "Agujitas 2", is an alternative path of development for the community based on adoption of an ICZM program and employment of Participatory Rural Appraisal (PRA) as a method of involving the community in program formulation. The scenarios are based primarily on interviews with the local community as well as ground-truthing in the study site, interviews in other coastal communities and agencies in the capital, and research of published and unpublished documents. The author took two trips to the study site. The first trip allowed for collection of baseline data to develop "Agujitas 1". The second visit was designed to present the "Agujitas 1" scenario to the community and incorporate their reactions and suggestions into the development of "Agujitas 2".

2.0 Coastal Zone Management in Costa Rica

2.1 Law on the Marine and Terrestrial Zone (Law 6043)

Costa Rica is the only Central American country that has an official coastal area management program. Efforts to manage the coastal zone have concentrated on assuring public access and regulating development within the "marine terrestrial zone" (ZMT), which extends inland 200 meters from the high tide as defined by the Law 6043. This law was enacted in 1977 in response to growing concern over degradation of the coastal zone by unplanned residential and tourism development, as well as interest in the potential national and local income from tourism development (Sorenson, 1990). Sorenson has outlined the three primary objectives of Law 6043:

- "protection of the natural resources of the coastal zone;
- development of tourism;
- implementation of the objectives of the former law, 4558, enacted in 1970, mandating a plan for recreation, tourism, and residential development and a process for giving concessions for development" (Sorenson, 1990).

The ZMT is divided into two sections: a "public zone" defined as the first 50 meters inland from the high tide mark, and a "restricted zone" that comprises the remaining 150 meters of the ZMT. As a general rule, no development is permitted in the public zone. However, there are exceptions to this rule for those activities that are coastal dependent and must be situated next to the sea, such as port installations (Sorenson, 1990). Furthermore, Law 6043 does not apply to the 30% of coastal land that was privately owned and registered before October 1970 nor to the following locations:

- "cities situated on the coast;
- national parks and refuges;
- port areas;
- mangroves and estuaries;
- the northern part of Limón Province, that is under jurisdiction of the Board of Port Administration and Economic Development of the Atlantic watershed (JAPDEVA)" (USAID, 1992, Sorenson,1990).

When all of these exceptions are taken into account, only 45% of coastal Costa Rica is under the jurisdiction of Law 6043, raising the question as to the effectiveness of the law in regulating development (Sorenson, 1990).

2.10 Institutional Framework

There is no single agency in charge of implementing Law 6043. Overall supervision of the coastal zone is by the Costa Rican Institute of Tourism (ICT), but several agencies share responsibility for different parts of the law. These include the National Institute of Housing and Urban Planning (INVU), the Ministry of Public Works and Transport (MOPT), the National Parks Service, the Forest Service, the Wildlife Service, Port Authorities, the Fisheries and Aquaculture Department of the Ministry of Agriculture, the General Forestry Directorate (DGF), the Wildlife Service, The Water and Sewerage Service (AyA), the Agricultural Development Institute (IDA), the National Registry, and the municipalities. This plethora of institutions involved in the coastal zone and the little coordination amongst them inevitably makes implementation of the law difficult (CEDARENA, 1992).

2.11 Regulation Plans and Schemes

The ICT is responsible for identifying all those coastal lands within the ZMT possessing tourism value (Sorenson, 1990). An indication that Law 6043 is targeted at promoting development is the requirement that "regulation plans" must be developed for those areas with tourism value and less detailed "regulation schemes" are required for non-tourist areas¹. This fails to take into account non-tourist types of development such as

¹ According to Sorenson, the current portion of the coastline that has national tourism value is not a static figure. Not all coastal areas have gone through the ranking process so more coastal areas could be added to the current list of areas with national tourism value in the future. To determine whether a section of the coast has tourism value the coastal zone is first divided into six sections: coastal ocean, the beach, bluffs or cliffs, the higher portion of the beach, the general physical conditions (e.g. access or infrastructure), and the condition of the physical environment (e.g. rainfall, ecological values). These six are then divided into two additional criteria: the positive and negative tourism factors. These criterion are then given a score from zero to four. This is summed for the 52 possible positive criteria and subtracted from the sum of the possible 61 negative criteria. A beach must receive a positive score to be designated as having national tourism value (Sorenson, 1990)

industry or agriculture that might impact coastal resources (CEDARENA, 1992).

Regulatory plans were initially used for planning purposes under the urban planning law in the 1950s. The plans were requisites to all development, not just coastal development, and did little to address protection of the environment (CEDARENA, 1992).

The staff of either ICT, INVU, or private firms prepare the regulatory plan. A typical plan goes through the following steps:

- "inventory of the current situation;
- inventory of natural factors;
- environmental suitability analysis;
- land use plan and regulations;
- review and adoption by the executive council of ICT or INVU;
- review and adoption by the council of the local government; and
- optional review in public meeting" (Sorenson, 1990).

There are five main objectives of the regulatory plans as suggested by Roberto Chaverri, former ICT administrator of the coastal program. These are:

- "clear the public zone of all non coastal-dependent development;
- provide as many public accessways to the beach as possible;
- minimize compensation to those with vested rights;
- reduce the number of residential lots that could be developed with existing permit letting practices of local governments;
- incorporate a mix of land uses that are mutually supportive of economic development, tourism, and recreation" (Sorenson, 1990).

In addition to these, the ICT has outlined other sometimes contradictory functions of regulatory plans in its Operating Manual for Preparing Regulatory Plans in the Coastal Zone include:

- carrying out regional titling;
- guaranteeing the needs of the local people;
- establishing norms for controlling soil use;
- providing tourist services in accordance with coastal resources;
- contributing to regional development, in accordance with coastal resources, through decentralization of tourism;
- increasing investment towards the conservation of natural resources;
- establishing development criteria for both recreation and conservation in the coastal zone;
- defining an implementation program that incorporates different institutions;
- forecasting services and infrastructure necessary for the general public;
- promoting tourism development;
- developing implementation strategies for projects;
- collaborating the efforts of ICT, INVU, and the municipalities (ICT, 1991).

It is difficult to achieve all of these simultaneously and Law 6043 fails to provide guidance on these objectives and policies used to design a regulatory plan. However, the ICT and INVU have stated that the primary goal of regulatory plans is to encourage and facilitate the public's right to recreational use of the beach to the extent that environmental degradation is avoided. To achieve this objective, the following policies have been adopted by ICT and INVU as outlined by Sorenson (1990):

- "Priority is given to land uses that are tourism or recreation oriented.
- 30% of the area in restricted zone shall be in open space and public use such as parks, public parking spaces, the landscaping area of the coastal boulevard, and government buildings. (the 30% allocation is applied after subtracting the areas covered by roads from the total.)
- All plans must include hotel and tourism commercial uses. The plan should discourage the development of permanent residential communities and encourage vacation communities that allow the occupancy of the same units by multiple users.
- The minimum residential lot size is 15 meter frontage with a 20 meter depth. The maximum lot cannot exceed 30 meters of frontage and a total area of 2000 meters squared. The average lot should have approximately 20 meters of frontage and be 30 meters deep.
- The total number of residential and hotel units allowed for any beach system must be limited by either the recreational carrying capacity of the total beach and water contact area or by the supply of potable water in the surrounding areas. Whichever capacity is lower is the limiting factor on the total number of units.
- To the extent possible, all stands of native coastal vegetation are preserved. Camping grounds, for example, are located in stands of native coastal forest.
- All streams should have a 5 meter buffer zone on each bank where development is prohibited; mangroves and wetlands should have a 10 meter buffer zone.
- A variety of overnight accommodations should be provided" (Sorenson,1990).

Traditionally, regulatory plans that have been implemented have taken some of these factors into consideration to help guide development while at the same time protect the resource base. It is not possible to determine the success of most of the regulatory plans that have been developed to date, in Costa Rica, since no complete evaluations have been undertaken. One example of failure was in the community of Tortuguero, on the Atlantic coast. The community and other governmental and non-governmental organizations with

projects in the region, proposed the adoption of a regulatory plan. The plan was both professional and thorough in most aspects. However, the community was not involved in the planning process and, as a result, the plan was not whole heartedly accepted by the village, undermining the long-term success of the plan (DEPPAT S.A., 1992). Most regulatory plans have been limited to and proposed by private landowners in the coastal zone and not entire communities. However, INVU and the ICT propose regulatory plans for both private landowners and communities based on the immediacy of development and the potential impacts of the proposed development.

The average time taken to prepare a regulatory plan is six months in rural areas and one to two years in cities. The average cost is between \$3,000 and \$4,000 (Sorenson, 1990). However, there is not adequate funding for elaboration and implementation of regulatory plans under Law 6043. As of November 1989, only 34 regulatory plans had been written and 7 were underway. Approximately 141 regulation plans are needed to cover the jurisdiction of the law (Sorenson, 1990). This has resulted in pressure to develop the remaining lands without regulation plans before restrictions are placed on the use of the land.

2.12 Concessions and Compensation

The coastal municipalities have the most direct and important role in managing the coastal environment and enforcing the law (Sorenson, 1990). A concession is necessary in order to develop all lands within the restricted zone. The municipalities are responsible for granting concessions in the restricted zone, but the ICT or INVU must approve them if there is no development plan in force. The annual charge for a concession under the law is a percentage of the value of the parcel and this is reassessed every five years (USAID, 1992). All revenues from the concessions go to the municipalities. Part of this money is

supposed to go towards financing implementation of Law 6043. However, non-payment of concession fees and improper spending of revenues by the municipalities are common (CEDARENA, 1992). Concessions can only be granted for development within the restricted zone if a regulatory plan or regulatory scheme has been prepared. However, in practice, this is rarely enforced by the local municipalities and concessions are often granted without such plans (Sorenson, 1990).

Demolition of illegal developments is another way in which coastal development has been controlled. Illegal developments are those that were built in the ZMT without permission after Law 6043 was enacted in 1977 (Sorenson, 1990). Approximately 17 illegal developments were demolished between 1977 and 1990 and no compensation was provided to the owners. In addition, approximately 16 developments built in the public zone before the law was enacted have been destroyed during this period with compensation. Compensation was based on the value of the development (Sorenson, 1990).

2.13 Enforcement

No new development within the ZMT is permitted until regulation plans have been executed and concessions have been offered to developers (Sorenson, 1990). However, enforcement of Law 6043 at the municipal level is weak. Municipal inspectors often do not inform property owners of the need for regulatory plans prior to development nor do they respond to complaints about violations. They often lose or delay paperwork and court decisions. Municipal governments also sometimes fail to carry out court orders and thereby allow offenders to continue illegal development. It is estimated that only 30%-40% of ICT claims of violations of conditions stipulated in a concession are upheld in court (USAID, 1992). Other issues that help explain the low success rate in prosecuting

violators are the constant turnover of judges in rural areas, lack of court experience in this area, and unwillingness of the courts to get involved in local issues (USAID, 1992).

While Law 6043 has serious flaws, it has one very strong point: the inherent simplicity of the concept of the ZMT. Practically everybody living in coastal zones knows and understands that the first 50 meters from the high tide line is off limits to development, and that a concession is needed to develop the adjacent 150 meters. Thus the principal problem with the current law is not education, but rather implementation and enforcement (CEDARENA, 1992).

Costa Rica's current coastal zone management program is faced with the challenge of regulating diverse land uses in the coastal zone. Land uses include logging, agriculture, mining, livestock grazing, and tourism. Tourism, in many cases, is perhaps the most economically promising of all uses of the coast. However, if Costa Rica plans to continue tourist expansion in these fragile areas it must find a way to develop in a sustainable manner so that the attractions that draw people to these areas in the first place are not destroyed.

3.0 Agujitas

3.1 Introduction to the Osa Peninsula

One of the areas in Costa Rica with the greatest tourist potential is the Osa Peninsula (see maps 1 and 2). This mountainous and largely forested peninsula juts southward from Costa Rica's southwestern coast and then curves eastward. The peninsula's 90 kilometer Pacific coast alternates between long sandy beaches and rocky, forested bluffs, terminating at Punta Matapalo where the peninsula's rugged central mountain ridge drops sharply into

the sea. Along the shore of the Golfo Dulce the coastal plain widens and as the waves of the Pacific Ocean lose their force along its length, the beaches become narrower. Along the coasts of the peninsula, several rivers and mangrove estuaries interrupt the beaches. Other natural attractions the peninsula boasts include its rugged mountains, lagoons, waterfalls, caves, and places to observe the great diversity of flora and fauna such as Corcovado National Park (103,221 acres), Golfo Dulce Forest Reserve (172,900 acres), Sierpe River with its extensive mangrove system, and Caño Island Biological Reserve (494 acres). In addition, there exist a great number of trails in various places of the peninsula that could be utilized for ecotourism, scientific, and recreation purposes (Fundacion Neotropica, 1992).

3.15 CEDARENA's Land Titling Project

CEDARENA, a natural resource and environmental law center based in San Jose, Costa Rica, has recently received a grant to initiate a project in the Osa Peninsula in conjunction with ACOSA (Osa Conservation and Sustainable Development Area), a governmental entity responsible for the administration of the Osa Conservation Area, and the BOSCOA program (Program for the Conservation and Management of the Forests of the Osa Peninsula) of a Costa Rican non-governmental organization, the Neotropica Foundation. The project will consist of designing and implementing an integrated process of land use planning, zoning, and land titling in the peninsula. The goal of the process is, on the one hand, to create land use restrictions based on land use capacity, actual use and other social, economic and ecological factors in order to improve land uses and productivity and help maintain the biodiversity of the zone. On the other hand, the project seeks to provide an important immediate benefit to the people of the region by stabilizing an extremely disordered land tenure situation through land titling and land concession programs. One component of the project is to undertake an intensive study of activities in the coastal zone to prepare a profile and a preliminary strategy for developing an integrated

coastal zone management program on the peninsula. This will involve initiation of a pilot project in a coastal community on the peninsula (CEDARENA, 1992).

3.2 Introduction to Agujitas

The site chosen by the author and CEDARENA to initiate the pilot project is a small village, Agujitas, located on the northeast coast of the Osa Peninsula (see map 2). Agujitas is one of five villages on the north side of the Osa Peninsula that makes up what locals call the "Drake region". Agujitas was selected because it is representative of other coastal areas in Costa Rica where Law 6043 has been largely ineffective in addressing degrading land-uses in the watershed and beachfront development. In addition, its small size, (200-250 people) makes it a manageable area to study and initiate a pilot project.

3.25 Description of Agujitas

The area surrounding Agujitas is mountainous and relatively forested. The predominant life zone is Tropical Wet Forest (CCA, 1991). Wildlife is abundant in the area. Resident populations of white-faced monkeys and large flocks of scarlet macaws are frequently visible. A large number of migratory bird species use the peninsula as a stopover or winter range. These include a variety of shorebirds, raptors, and passerines. Other mobile species such as jaguars and peccaries reside in Corcovado National Park and occasionally pass through the area (CCA, 1991). Although its red, clay soils are generally poor for agriculture, its rich biodiversity and proximity to Corcovado National Park, Sierpe River, and Caño Island Biological Reserve render it a profitable area in attracting tourists (Fundacion Neotropica, 1992).

The study area receives an average of 3,800 mm of rainfall on the coast and more than 5,500 mm in the higher elevations (range of elevation and topography description). The rainiest months are September, October, and November and the driest months are January, February, and March. However, the rainy season is said to start in April and begins to subside in November. The tourist seasons correspond to the rainy and dry periods as high season occurs from December to March and the low season from April to November. Agujitas has an average temperature of 27 degrees celsius with a maximum of 30 degrees and a minimum of 24 degrees celsius. Humidity fluctuates between 78% and 83%. At the end of August and during September, when the rain starts up again, the area experiences storms with strong winds, taking down branches and sometimes whole trees, as well as damaging homes (DEPPAT S.A., 1988).

Although small in comparison to many other coastal towns, Agujitas has been dubbed "the capital" of the Drake region by the local people. It not only has the largest population of the five villages, but also has the most public services. These services include 4 supply stores, 2 bars, a school, a health center, a mail service, 2 solar public telephones, 6 year round tourist lodges, boat service to Corcovado National Park, Caño Island Biological Reserve, the village of Uvita, and the village of Sierpe, and a landing strip for private planes (see map 4). However, it still lacks many of the basic services of many other coastal towns. Despite the existence of a health center, there is no permanent doctor or medical assistant. Other missing services include a police post, electricity, waste disposal facilities, a community center, church, restaurant, and alternative transport (e.g. bus system).

3.3 History of the Osa Peninsula and Agujitas

Prior to the 1950s the Osa Peninsula was very inaccessible requiring several days travel from San Jose by land and sea. Because of the remoteness of the peninsula, some of the earliest settlers in the area were fugitives running from the law. Around 1930, Yellow Fever decimated much of the population on the peninsula. Since then much of the peninsula has experienced rapid growth as new roads were built down the gulf side. Growth in Agujitas has been much slower, probably because of the inaccessibility to the region and lack of public services. A resident of Agujitas said that in 1935 there were about 3 or 4 families in the village. Another resident reported that there were approximately 6 families in the village in 1950. In the last 43 years, approximately 30 more families have moved into the Agujitas region (Interviews, Isabella, Don Carmen, 1992).

In 1957 the Costa Rican government sold approximately a third of the peninsula to a U.S. company, *Osa Productos Forestales*. The company owned a large portion of the land in the Agujitas region at this time. *Osa Productos Forestales* allowed the farmers already living on the peninsula to lease back their plots from them. During the period between 1972 to 1974 there was rapid population growth on the peninsula (3,707 people to 6,177) and disputes between the farmers and company resulted in violent clashes. In response, the government began to consider the possibility of expropriating the company. In 1975, President Daniel Oduber and *Osa Productos Forestales* agreed to trade land in order to create Corcovado National Park whereby *Osa Productos Forestales* would vacate approximately 16,790 hectares of land for approximately 14,283 hectares of land elsewhere on the peninsula. Over 300 people who inhabited the park at the time were subsequently relocated with minimum compensation (Wessels, 1992). As Bauer reports, "These events fomented social conflict over several decades, resulting in a transient and aggravated local population, fragmented and insecure land tenure, economic instability, a

deep mistrust of government, and rampant deforestation" (Bauer, 1992). The peninsula received an additional large influx of settlers in 1986 when United Fruit Company shut down the banana plantations in Golfito, a port town located on the bay of the Golfo Dulce (see map 1). Many workers seeking land migrated to the Osa Peninsula, resulting in massive deforestation as they sought to establish farms on unoccupied lands (CEDARENA, 1992).

3.35 Land Tenure in the Osa Peninsula

The problem of deforestation in Costa Rica is complex, driven by a series of economic and social factors, including land usage, laws and tenure rights, in combination with population growth, economic incentives, and strong foreign influence over the national economy. The unclear and very complex land tenure situation on the peninsula is the primary legal obstacle to sustainable development in the region (CEDARENA, 1992). Most people in Agujitas do not own title to their land as they cannot afford to pay \$5.00 per hectare plus lawyer fees to title their property. Consequently, they live in constant fear that the government will remove them from their land or restrict their ability to use it as happened with the establishment of Corcovado National Park (Interview, Don Carmen, 1993).

Local people living outside and within the Forest Reserve are restricted in how they can use their land by the Forestry Law (*Ley Forestal- No. 7174*) (CEDARENA, 1992). Landowners must obtain permission from the Forest Directorate (DGF) before they can cut any trees on their property. Those people living in the Forest Reserve are further restricted in how they can use their land by the Forestry Law and its regulations (see map 3). The law stipulates that Forest Reserve land is public and cannot be titled in the name of an individual unless that person can prove that he or she has lived on and personally worked

the land for ten years prior to the declaration of the Golfo Dulce Forest Reserve (Wessels, 1992). The DGF, which is partly responsible for administering the Forest Reserve, does not give leases to people living on the land, but instead cutting permits. However, in practice, enforcement of the Forestry Law by the DGF is weak and illegal felling of trees continues within the Reserve.

The land tenure situation in the Reserve is further complicated as a result of poor planning in the seventies which left two governmental bodies, the Forest Directorate (DGF) and the Institute for Agrarian Development (IDA), with conflicting purposes in charge of the same land. IDA's mission is agrarian development, not forestry. Approximately 60% of the people living within the Reserve are on IDA settlements and are supposed to farm these areas. Unlike other areas in the Reserve, local people on these settlements are granted tracts of land by IDA and these are subject to temporary (fifteen year) restrictions. However, at the same time, landowners on these settlements are strictly limited in their activities by the Forestry Law that the DGF implements. This creates much confusion as to how the land can be used in these settlements (Wessels, 1992).

Without title, landholders inside and outside of the Reserve are not legally entitled to the natural resources on the land. As a result of this insecurity, many of the settlers cut the trees on their land and sell the wood as quickly as they can. Farmers without title to their land find it hard to acquire agricultural credit and to qualify for public subsidies designed to improve land use. In order to have any motivation to manage forests for long-term sustainability, or to invest in more cash-intensive, sophisticated and sustainable agricultural practices, the landholder must be secure in his/her long-term rights to the land and the resources on it (CEDARENA, 1992). The BOSCOA program is attempting to both zone land according to land use capability studies and carry out a titling program within the Forest Reserve. Though landowners within the Reserve cannot obtain absolute

ownership of the land, BOSCOA seeks to order the land and provide leases on properties that can be renewed automatically if local people fulfill contractual obligations for sustainable use of their land (Wessels, 1992).

3.4 Access to Agujitas

Access to and from Agujitas is still the major factor limiting growth in the region. It is also a popular topic around the community and the primary concern of the local development association. Currently, the majority of the locals rely on boats for transport to Sierpe where many buy their goods. The boats are not only expensive for the locals (approximately \$9 round-trip), but it is also dangerous since they must pass through the often rough mouth of the Sierpe river. At least 60 people have drowned trying to cross it. There are plans to build a better road to the Drake region in January 1993. However, few locals believe that this will happen as there has been talk of a better road for a long time. There currently exist 2 plowed dirt roads leading into the village, built in approximately 1985 and 1988. Both are rarely in suitable condition for use by vehicles. The new road would be "all season" (dirt with gravel poured on top) and would connect the area to towns on and off of the peninsula (see map 2) (Interviews, Pedro, Benita, Emiliano, 1992).

3.45 Land Use in Agujitas

The coast of the Osa peninsula is still relatively unfrequented and untouched, but this is quickly changing as access becomes easier. The major factors threatening coastal areas, such as Agujitas, on the peninsula are the offsite impacts of inappropriate land uses and deforestation in the watersheds. Despite many positive steps such as the establishment of parks and reserves, Costa Rica has one of the highest deforestation rates in Latin

America.² The World Resources Institute points out that "Costa Rica's forests are an economic asset capable of producing important economic benefits, both directly through marketable products and indirectly through watershed protection, environmental stability, tourism, and other forest-dependent activities. But deforestation represents a fantastic waste of the nation's natural resources" (World Resources Institute, 1991) The primary land uses in Agujitas that currently contribute to deforestation of the watersheds include logging, cattle grazing, and agriculture.

3.451 Logging

The Osa Peninsula is the site of one of the most important remaining lowland tropical forests in Central America and is among the poorest and most underdeveloped areas of Costa Rica. This is not a coincidence. The slow pace of development here is a primary reason that much forest remains. In the past few years, however, new roads have removed the long-standing isolation of the peninsula, and as settlers move in and clear land for cattle ranching and subsistence agriculture, loggers buy the trees and truck them to the capital, San José (CEDARENA, 1992). Concessions and permits to harvest an area require a forest management plan approved by the DGF. However, the DGF does not make adequate field inspections before approving the plans nor does it perform periodic inspection during the logging operation (USAID, 1992). According to a study commissioned by U.S. AID, in 1988 approximately 83% of the wood authorized for harvest nationwide came from the Forest Reserve on the Osa Peninsula (USAID, 1992). Unless significant steps are taken, within a few short years little forest will remain outside

² 11% of the land in Costa Rica is dedicated to absolute preservation in the form of national parks and biological reserves. However, forested lands outside of these areas are disappearing at an average rate of 50,000 hectares per year. By the year 1995 it is estimated that Costa Rica will become a net importer of wood (Mateo, 1990).

of the peninsula's Corcovado National Park and the resources of the park itself will be threatened.

Because of difficult access to the Drake region, the land in the study site is not subject to any large-scale logging operations as it is difficult to extract and transport the logs. The Forest Reserve begins approximately 1 km. in from the coastline in the study region and much of the locals' land falls within the boundaries of the reserve. Outside of the reserve some small-scale deforestation is taking place (mostly along the Agujas River) for construction materials and clearing land for crops and pasture (see map 3).

3.452 Cattle Grazing

According to the World Resources Institute, "cattle ranching is the chief source of land misuse" in Costa Rica. Nevertheless, cattle grazing has been increasing on the Osa Peninsula, usually on lands not suitable for this use. As the economic decline has hit ranching over the last decade, large tracts of spoiled pastures have been abandoned (World Resources Institute, 1991). In other areas, where erosion of steep, clean-tilled surfaces has cut the land's productivity, pastures have replaced crops. For more than 30 years the cattle industry was favored by the national banking system as cattle ranchers received large amounts of credit at lower than normal interest rates with a long payback period. The general banking policy has been that cattle can be used as collateral to secure loans while crops and standing timber cannot, creating an incentive to convert forest to pasture. While available credit to ranchers has been reduced, a recent exception is a program, Promotion of Agriculture and Livestock Development (FODEA), that assists ranchers on the verge of bankruptcy (USAID, 1992). As a result of misguided subsidies and incentives, overgrazing and unrestricted ranging of cattle has contributed to high rates of erosion, landslides, and other forms of soil damage including compaction.

Locals in Agujitas do graze cattle, although there seems to be significantly more pastureland than cattle. One local said that people do not have more cattle because the land cannot sustain a large amount of livestock due to the poor soils. He reported that his 150 hectare plot of land could only support approximately 20 head of cattle. In Agujitas, the environmental problems associated with cattle grazing are not only the impacts of overgrazing, but also where the cattle are grazing. Often cattle can be found foraging along stream and riverbanks or on steep hills. This not only causes soil erosion and compaction problems, but also pollutes the water (Interview, Omar, 1993).

3.453 Agriculture

In tropical humid forests, such as those found on the Osa Peninsula, soil quality restricts the use of the land. Thin topsoil, low in available nutrients for plant growth due to leaching by heavy rainfall, coupled with climate and topography, renders these lands unproductive and able to sustain limited activities.³ According to the General Soil Map of Costa Rica, land in the study site is of variable productivity, consisting of residual soils that are extremely susceptible to erosion and leaching (Tropical Science Center, 1982). One local, who has lived in the area for 19 years, reports that wealthy people (usually foreigners) came into the region and bought the productive land from the poor people and then developed the land or turned it into cattle pasture. This left the poor to farm the marginal lands. Because the soil on these lands was rapidly depleted, farmers further deforested the watersheds for new soil on which to grow their crops.

³ Over 78% of Costa Rica's soils are moderately to extremely susceptible to erosion and inappropriate land uses have contributed to severe erosion problems throughout the country (USAID, 1992).

Approximately 20-25 years ago, the locals owned enough productive land to raise crops commercially. A boat came from Puntarenas every 8 days or so to buy produce from the locals. Today, locals farm the land in Agujitas, but generally only for subsistence purposes. Crops include corn, rice, beans, banana, cocoa, coconuts, sugar cane, mangos, chamor, avocados, yuca, plantain, and papaya. Many locals claim they are not able to grow as much because the fertility of the soil has decreased. They also said that much of the land falls within the Forest Reserve, thus they are unable to clear any more of their land to expand their agricultural practices. Many locals argue that this is prohibiting them from growing crops on a larger scale, making them increasingly dependent on tourism to bring in additional income. They expressed concern that they might be arrested if they cut down trees within the reserve without legal permission (Interviews, Thelmo, Don Carmen, Pedro, 1992). However, this sentiment is inexplicable since enforcement of the forestry laws is notoriously weak on the peninsula and most of the logging in Costa Rica is currently occurring within the Forest Reserve.

Grober and Fernald carried out a study in a small watershed of Agujitas to determine the best land use practices given the natural limitations of the area. This analysis reveals that the majority of the land they tested, both within and outside of the Reserve, is best suited for selective logging and preservation of natural forest for watershed protection. The slope of the land is usually too steep to use as pasture or intensive cropping although there are some flat areas that are currently idle, but could be utilized for these purposes. Grober and Fernald noted, however, that most current land uses in Agujitas are in contradiction to land use capacity analyses as the majority of the land is used for livestock. Land use practices in contradiction to the inherent optimal use of the natural area will cause increased problems with the measured parameters such as erosion, depth of soil, and nutrient availability (Grober and Fernald, 1992). According to the Tropical Science Center, lack of land use planning, regulation, and land use capability analyses have contributed to

uses of land in contradiction to land use capacity. One result is very inefficient utilization of the natural resources of the Osa Peninsula, as some lands are over-exploited while others are underutilized (Tropical Science Center, 1992).

Watershed degradation in Agujitas is having significant and far reaching consequences. Under natural conditions, the fragile and highly infertile residual soils of the area are protected by a dense wet tropical forest of high species diversity. The forest cover buffers the system against excessive runoff and nutrient loss, and helps to prevent accelerated erosion. The stability and quality of downstream water supplies, and coastal environments depends largely on protective upland forest cover (Grober and Fernald, 1992, CCA, 1991). In Agujitas, inappropriate land use are impacting the quality and quantity of potable water for the villagers and tourists, clearing coastal vegetation to give way to development and agriculture, increasing sedimentation runoff into the bay in front of the community making it an unsuitable area for locals and tourists to recreate, increasing loss of soil nutrients through erosion, and causing flooding of rivers (Grober and Fernald, 1992, Interview, Marta, 1993).

3.5 Tourism in the Osa Peninsula

Another land use that is rapidly increasing in Costa Rica is tourism. In 1991 there were 513, 000 visitors to Costa Rica, an increase of 15% from 1990. This brought in \$336 million, an increase of 26% from the previous year (Fundacion Neotropica, 1991). While the industry generates much needed income for the country, tourism can bring harm to the environment and the local people. Tourism often tries to provide what people from the city would expect from home. In providing these things, it puts a great strain on the areas it is developing and can have severe impacts on the local culture. The long standing isolation of the Osa peninsula in the past contributed to the preservation of its natural beauty

and underdevelopment. However, this is changing as new roads, landing strips, and boat service are not only making the area accessible to loggers and people looking for new lands to plant their crops, but also to developers interested in exploiting the area's beauty for tourism purposes. Tourism on the peninsula will surely boom when the Pacific coast highway, now under construction, is finished, greatly increasing access to the peninsula (see map 1).

3.55 Tourism in Agujitas

Agujitas is fairly isolated in relation to other coastal towns on the peninsula. However, the community has a fairly well developed tourism infrastructure. There are currently 6 lodges open year round and two more small operations open during the high season. Two of the six lodges are owned and run by Costa Ricans. The other four are run by expatriates who live in Agujitas year round. The lodges are constructed mostly of local wood and palms, blending well with the landscape and atmosphere of the region. All of these lodges are relatively small in scale and together offer a total of about 111 tourist beds (approx. 20 more during the high season) and employ approximately 58 people during the high season and 23 during the low season. During the high season the lodges remain full most of the time, but during the low season the numbers drop off considerably though this has been changing in recent years. The lodges provide rustic accommodations for tourists although there is a range in comfort and amenities levels as reflected in the prices (\$15-\$75 a day including meals). Most tourists stay an average of 3 days, spending one day on Caño Island snorkeling or diving, one day at Corcovado National Park, and another day exploring, horseback riding, swimming, and relaxing in Agujitas. There are variations to this agenda (such as sport fishing), but the majority of the tourists follow a beaten path when visiting the region (Interviews, Rob, Herb, Pedro, 1992).

Transport to, from, and around the area is limited to boat service, private air taxis (landing at a nearby runway), and hiking or riding horses. There is an excellent hiking trail that parallels the coast, starting from Agujitas and continuing down to the southern boundary of Corcovado National Park. This is utilized by both tourists and the local people. It is sometimes possible to drive a private car from Rancho Quemado to Agujitas during the dry season, but the road is poorly maintained and access through this means is more often than not impossible (see map 2 and 3). Most tourists either fly into Drake or take a boat from Sierpe or Uvita (1 hour and 2 hours respectively) (see map 1). Agujitas is the main "jump-off" point on the peninsula for tourists visiting Corcovado National Park and Caño Island Biological Reserve. Access to these destinations is usually by boat. While there does not seem to be a shortage of boats to meet tourist demands, many tourists felt that they were held captive by the boatmen and had to pay high prices in order to see the attractions that brought them to Agujitas (Interviews, Claire, Tom, 1992, Rafael, 1993).

Though many locals contend that the main factor keeping many tourists from visiting Agujitas is the difficulty and expense of getting there, tourism has been rapidly increasing in the region in the last few years and is expected to continue growing (Interview, Sergio, 1993). The locals perceive this growth as positive and would like to see this trend continue in the future. Tourism has not only brought in more customers to existing businesses, but has also created jobs for the local people. Some local people expressed desire to open their own tourist enterprises. However, high interest rates (30%-37% annually) on bank loans make it virtually impossible for them to financially do so. The president of the local development association pointed out that the national government has done little in the way of assisting the town in developing tourism projects that would directly benefit the local people. Meanwhile, the government also prohibits landowners from cutting trees in the Forest Reserve without a permit, obtainable only by an extremely

lengthy process. This limits the economic use of their land, making them more dependent on tourism income (Interviews, Sergio, Pedro, 1993).

Tourism represents a very important source of potential income for the residents of the peninsula, but only if they are prepared to take advantage of opportunities. Tourists are arriving to the area from around the world, though the majority of visitors are North Americans or Europeans (Interview, Rob, 1992). Most tourists who visit the area either arrange their stay in Agujitas through a travel agency or directly contact the lodges and make reservations prior to their arrival. Visitors usually learn of Agujitas by word of mouth from friends who have been to the area or other travelers in Costa Rica (Interviews with tourists, 1992, 1993). Most popular travel guide books have also written sections on the Drake region. However, these books have failed to include some of the smaller, Costa Rican run lodges in Agujitas, increasing the likelihood that they will not be as popular as foreign owned lodges. To date, there is little evidence of tourism having a large negative impact on the local people and environment in Agujitas. However, the community has done little in the way of planning for growth and increased tourism to mitigate possible future problems and take advantage of the opportunities tourism might provide.

3.6 Water Supply in Agujitas

One of the main factors in determining the capacity of an area to absorb more growth is the community water supply. In Agujitas, there already exist some water quality and quantity problems due to degradation of the watersheds and faulty construction of the main water supply line. While some locals have small water supplies from small creeks, the majority of the residents (approximately 200 people including 4 lodges) rely on one tributary of a creek owned by the pastor of the village, Don Carmen. Don Carmen's watershed is predominantly deforested with much of the area converted to cattle pasture.

Most of the creek has a forested buffer around it. However, at the head of the creek is a cattle pasture draining directly into the creek. This has contributed to water quality problems as cattle borne pathogens and increased sedimentation run into the water supply. The water quality for individually owned water supplies has also proven to be of poor quality. One hotel, Drake Wilderness, depends on a one half square kilometer watershed for its water and most of the drainage is cattle pasture grazed sporadically by 6 to 10 cows. Water was found to be contaminated with fecal coliform and the Ministry of Health has required that all water for hotel guests be boiled (Interviews, Don Carmen, Pedro, 1992).

The public water supply has a few technical deficiencies that also threaten continued drinking water availability. The intake is a simple tube covered by mesh screen that can be readily blocked by leaves or other debris. The pipes used to transfer water from the holding tank on Don Carmen's property to the town are designed for low pressure drainage and are inadequate for the pressures in the pipe. This has resulted in many leaks in the pipe. The pipe is also laid in the stream bed so rolling rocks or logs during high flows could easily break it (Grober and Fernald, 1992). In addition, the catchment tank is full of snakes that sometimes get into the pipes and block the flow. There is also a problem with the quantity of water since all users depend on a continuous flow of water in the creeks to guarantee a supply of potable water. Last dry season, flows on an adjacent creek that supplied the former public distribution system dried up for five months leading to installation of the current intake on an adjacent creek on the pastor's property. The exact reason for these shortages of water is unknown (Interview, Don Carmen, Pedro, 1992). With any growth in demand, the current supply is likely to fall short during the dry season (Grober and Fernald, 1992).

3.65 Waste Disposal in Agujitas

Agujitas does not have a serious waste problem at this time. All of the lodges have septic tanks that catch most of the wastes with the exception of most kitchen, shower, and laundry water. However, a common septic tank that services four of the lodges is within the 50 meter zone and could cause problems in the future. Garbage is disposed of by either burying it or burning it (Interviews, Sergio, Pedro, 1993). Agujitas does not yet suffer the trash problems many other towns do primarily because of its small size.

3.7 Law 6043's Effect in Agujitas

Law 6043 has proved unsuccessful at addressing many of these problems in Agujitas. For example, Agujitas has been declared of national tourism value by the ICT, but does not fall under the "city" exemption of Law 6043. Therefore, in theory, before any building can legally occur within the first 200 meters of the coast, a regulatory plan must be prepared. No plan has been prepared for the community nor has the law been adhered to by the villagers or enforced by the municipality located in Cortés. This is obvious when one walks down the beach and discovers that most beach front development has occurred within the first 200 meters and sometimes within the first 50 meters. Development within the 200 meter zone includes several lodges, the health center, the school, a few homes, and a couple supply stores (see map 4). Most of these structures are illegal since they were built after the passage of Law 6043. One resident reported that the shoreline has moved inland approximately 30 meters in the past 20 years and may eventually wash the current structures away (Interview, Marta, 1993).

Many local people claim that officials from the municipality rarely visit Agujitas to enforce Law 6043, possibly because of the difficulty in reaching the region. Others claim

that when they do visit the village they stay at the lodges and are easily swayed over by the owners who have built illegally within the 200 meter zone. This has resulted in a lack of enforcement. One lodge owner spoke of the incompetence of the municipality. He built without seeking a permit because of the lengthy process of obtaining it and the fact that officials from the municipality most likely will not show up to enforce the law. It is a commonly held belief that it is easier to build first and then wait for the municipality to detect the violation, claiming ignorance to the law (Interviews, Rob, 1992, Sergio, 1993).

In addition to development within the 200 meter zone, local people are cutting down the forests, planting crops, and grazing cattle within this limit. However, Law 6043 fails to address degrading activities in the watershed because of its limited scope, another weakness in the legislation. This was an important oversight in the adoption of this law because watersheds have a significant impact on the coastal environment. As Clark states, "The complexity of biotic systems and the inter-relatedness of their components mandate that each coastal water ecosystem be managed as a whole system. To be effective for management purposes, each coastal ecosystem delineated for management must identify and include 1) a defined water basin, 2) all marginal (shoreline) transition areas, and 3) all shoreland watersheds that drain into the coastal basin (shoreland is defined as all the lands of the coastal watersheds) (Clark, 1983). Clark goes on to say that

"Disturbances of the shoreland watersheds that significantly affect the quality, the volume, or the rate of flow of runoff coastal waters must be presumed to have the potential for adverse effects on coastal ecosystems. Such alterations of the pattern of freshwater inflow may interfere with a coastal ecosystem by causing changes in water circulation, flushing rate, salinity balance, sediment transport, or the natural supply of nutrients from upstream. These changes, in turn, affect the physical makeup of the estuarine zone and hence its plant and animal life. A great variety of

activities in the coastal watershed have the potential to seriously impair the quality of the freshwater discharge.... [These include] runoff from land surfaces contaminated with a variety of industrial, agricultural, logging, commercial or household residues...." (Clark, 1983).

Law 6043 also fails to address any activities offshore such as port installations and fishing activities that might impact coastal resources. While commercial fishing is not a source of income for the villagers in Agujitas, sport-fishing and subsistence fishing are currently important activities and provide a major incentive for mitigating coastal ecosystem problems.

3.75 Jurisdictional Problems

Another serious problem contributing to non-sustainable development in Agujitas is the lack of coordination among the public and private institutions that work on the peninsula. This problem is most pronounced between those agencies that work towards the preservation of the resources of the area and those that seek to promote agricultural production, logging, and development. The problem is further illustrated by the aforementioned plethora of institutions involved in administering Law 6043 and other agencies involved in the management of coastal resources (Sorenson, 1990). There is little coordination among these agencies, and the inevitable turf-wars make the system work even more inefficiently (CEDARENA, 1992).

3.8 Community Organizations in Agujitas

Several Agujitas organizations have attempted to address some of these and additional issues. The local Development Association's top two priorities for the

community are; 1) constructing a better road, and 2) reopening the Drake runway that is currently closed. Other possible projects in the future include construction of another aqueduct on Don Carmen's property and building a high school. Another group, Cerro Brujo Association, is composed of concerned locals in the Drake region who desire sustainable development of the region. They have reforestation programs and are interested in starting ecotourism projects. There is a women's cooperative of artisans who are involved in making crafts that are sold at the local lodges. They also have a desire to become more involved in tourism by opening up their own food stand. Fundación Integral Campesino is a group of 18 people from the region. They currently have a cattle project, but hope to start a tourism project with the aim of conserving the forests by using this land for ecotourism purposes. Unfortunately, there is no coordination amongst these various groups although many of their main objectives overlap (Interviews, Benita, Pedro, 1992, Sergio, Marta, Omar, 1993).

3.85 Community Participation in Agujitas

Besides these organizations, there is little community participation in those decisions impacting the region. The local development association is the voice for the community. The association is comprised of local community members and elections occur every four years. Public meetings are held approximately every 3 months to involve the community and gain support for the association's work plan. However, many locals feel that the president of the association has little interest in the future of the community and does not represent the opinions of the local people. They believe the president lacks vision, making choices based on short-term gain. Many feel that in the past the community was more involved when the association had members who expressed genuine interest in the community. However, one member of the association argues that there is community interest, but there are differing opinions. She said that 30-50 people on average attend the

development association meetings held every 3 months. Another local resident reported that only 3 non-members showed up at last month's meeting. While, in theory, the association has a lot of power, they have failed to use it in the past and as a result few of the local people have taken the association seriously (Interviews, Marta, store owner, 1993, Pedro, Don Carmen, 1992).

Despite the many issues the village is currently grappling with, most problems are not readily visible at this time and few of the tourists notice or are impacted by them. In fact, tourists interviewed were enjoying their stay in Agujitas primarily due to its isolation, tranquillity, natural beauty, uncrowded atmosphere, small-scale development, and friendly people. All of the tourists interviewed said they would return to the area and would recommend it to most of their friends. However, they were concerned when the possibility of a road was mentioned. They felt the extra effort to get to Agujitas was worthwhile and the road could potentially ruin the special aspects of the area.

3.9 The Future of Agujitas: "Agujitas 1" or "Agujitas 2"?

In the following two sections I will be sketching two development scenarios based on research, case studies, and interviews. "Agujitas 1", is a projection of what the village might be in the future given past and present trends in the region, the current views and priorities of the community, and the effectiveness of Law 6043 in managing the coastal zone. The development of "Agujitas 1" will be primarily driven by the current unregulated growth and the possibility of a road being constructed into the region. The second scenario I will sketch, "Agujitas 2", is an alternative future path of development for the community based on an Integrated Coastal Zone Management program. Central to this program is planned growth that ensures sustainable multiple use of the coastal zone, environmental protection, and citizen participation in the planning and implementation process.

4.0 Agujitas 1

4.1 The Road

There are several trends and issues in the region that will have an impact on the future development of the region. Perhaps the one issue that might have the most immediate and largest impact is upgrading and extending the current road from Agujitas to Sierpe, via Drake, Guerra, and Sabalo (see map 2). The inhabitants are divided on the issue of the road. Some support the road on the basis that it will bring in much needed public services, cheaper goods, and a bus service that would be cheaper and safer than boats. Supporters tend to include the local development association, logging companies, and some community members. Opponents of the road contend that it will open up the area to loggers and bus service will take much longer than boats.⁴ Making Agujitas more accessible, they argue, will bring in more people, leading to uncontrolled development, crime, drugs and alcohol problems, and environmental degradation. Opponents of the road include most lodge owners, most boat owners, and some community members as well. However, all locals interviewed expressed some degree of concern over the negative effects uncontrolled growth could potentially have on the area if there is no plan in place to control the inevitable influx of settlers and tourists. Even those who support a new road said that some sort of control was needed to limit growth in the area (Interviews with Don Carmen, Rob, Herb, Pedro, Marta, Sergio, Isabella, Santiago, Joseanna, 1993, Thelmo, Benita Emiliano, Rob, Herb, 1992).

⁴ Whether or not this statement is true will depend on a number of factors including the quality of the road, the condition of the bus, and the route of the road.

4.10 Puerto Viejo Case Study

Although it is not possible to predict exactly what the consequences of an improved road might be, it is possible to hypothesize by looking at similar case studies. One experience that is particularly useful to draw upon is that of a coastal community on the Atlantic coast of Costa Rica, Puerto Viejo (see map 1). Approximately 20 years ago a road was built connecting Puerto Viejo with Limón, a port city north of the village. Previously, Puerto Viejo was only accessible by boat, foot, or horseback. Not long after the road was built a disease, Monilia, wiped out the cacao crops that the local people depended upon for their livelihood. The local people spent their savings trying to rescue their crops, but to no avail. At this time increased accessibility to Puerto Viejo not only brought in tourists to the area, but also opened up the seafood market by making it possible to truck fish and lobster to Limón and the capital (Interview with Clinton, 1992).

Today the people in Puerto Viejo depend on tourism for their livelihood and welcome the increasing influx of foreigners. The locals no longer grow their vegetables and fruits as they can make more money in tourism. As a result, none of the children know how to grow crops since their parents are involved in tourism. This dependency on one source of income can be dangerous. Puerto Viejo became aware of this when an earthquake destroyed a bridge on the road between Puerto Viejo and Limón, cutting off the tourist flow for more than a year. Many locals were forced to close down their businesses and life became very difficult for the local people (Interviews, Javier, Edwin, 1992).

The road did bring in many needed services to the region including electricity, garbage collection, bus service, and electricity. However, tourism has had pronounced social consequences in the region as crime, drugs, and alcoholism have increased. There have also been environmental consequences as fish and lobster have been overexploited to

supply the hotels/restaurants and the capital city. The water supply is inadequate in both quality and quantity, garbage abounds in the streets, and uncontrolled development has occurred right on the water's edge. Most of the successful tourist businesses in the area are owned by foreigners, although they do serve as sources of employment for the local people (Interviews, Clinton, Javier, Edwin, 1992).

The road has also resulted in significant deforestation in the region. In particular, banana companies have cleared the forests for plantations. Off-site impacts of the plantations, such as increased sedimentation in rivers emptying in the ocean, trash, and pesticide runoff, have had serious implications for the locals of Puerto Viejo since their economic and social progress is closely linked to the viability of the ecosystem (e.g., tropical forests, coral reefs, seafood, clean beaches and water). While locals say that the road and tourism saved them when Monilia hit the area, they also lament the negative consequences of the road (Interviews, Edwin, Clinton, 1992). Law 6043 has been virtually ignored in Puerto Viejo and no regulation plan has been done for the village. Any attempts to regulate and plan for future growth in the area have been minimal and often too late.

4.11 Teacapan Case Study

Another case worth citing is that of a small, Pacific coastal community in Mexico called Teacapan. The region's semi-isolation came to an end in 1967 when the federal government upgraded the old road to an all-season, hard-surface road and built a bridge over a channel. Most of the rural population was involved in either small-scale commercial fishing or in agriculture. The road was welcomed by almost all of the regional population since it helped facilitate transport of shrimp and agricultural produce. Teacapan is the terminus of the new road. The road has become a mixed blessing as tourists began to visit

the pristine area for the first time. Some notable negative consequences include loss of important traditional customs and folk institutions, loss of real property as Mexican and foreign tourists began to buy up the land, and loss of autonomy as government officials outside of Teacapan took over the local political organization to protect the tourism enterprises (McGoodwin, 1986).

After construction of the road social problems soon ensued as more tourists arrived to visit the area. Some local youths began to smoke marijuana or obtain it for the tourists or became romantically involved with the tourists, putting a serious strain in many local families. Teacapan's youth particularly had illusory ideas about modern life in developed nations. They assumed that the life tourists led made possible full-time pursuit of recreation and relaxation, never having to work. This belief eroded the work ethic of the youth who saw their parents life of hard work as unrewarding (McGoodwin, 1986).

4.12 Effects of a Road on Agujitas

It is likely that Agujitas will experience many of the same social, economic and environmental problems as Puerto Viejo and Teacapan, given their similar situations. Tourism will increase along with demand for services to accommodate greater numbers of both settlers and visitors. Tourism can bring both benefits and costs to an area. A road and the consequent increase in tourism will likely bring in many public services to the community. These might include a full-time medical assistant, garbage service, electricity, better mail service, more telephones, and alternative and safer transportation such as a bus service.

4.13 Social Consequences of a Road and Increased Tourism

The road and more tourism might have negative consequences as well. To date there are no serious crime problems in the region. This is partially because the community is small and most everybody knows one another. However, the isolation of the community is another reason. If one commits a crime, it would be difficult to escape. There are no "fast getaways" for the general populace of Agujitas. While some locals expressed a desire to have a policeman in the region, up until now there has been little need for one. However, this could change with the large influx of people the road could bring to Agujitas. According to Mathieson and Wall, studies show that tourism does contribute to crime. This is due to friction generated between the local people and tourists which may result in criminal activities (Mathieson and Wall, 1982). Tourists or outsiders whom come in to prey on the tourists might also be the culprits.

4.14 Economic Consequences of a Road and Increased Tourism

A road also might effect the local economy. Access to the region will enable food distributors to drive to Agujitas to stock the supply stores. Locals feel this would result in lower prices for consumer goods as well as the added convenience of not having to travel to Rancho Quemado, Palmar Norte or Sierpe to buy their goods (see map 2). In addition, it is believed that better access to the area will bring in even more tourists. However, even more important than the number of tourists arriving are measures such as average length of stay, total tourist expenditures, and net "foreign" exchange earned (Inskeep, 1987). Easier access to and from Agujitas would enable visitors to make day trips to the region or stay for shorter periods of time. This would result in less income to the community since day-trippers would not rely as heavily on accommodations and food.

The road will also likely have an inflationary effect on land values. Real estate values are already rising as foreigners are speculating on land in the region, offering prices the locals cannot refuse to pass up. For example, Don Carmen recently sold his property to a Costa Rican company (POZUELO) that is owned by Americans. When asked why he decided to sell he replied that he was offered a very good price and it would enable him to retire and leave money to his children. About half of the locals interviewed said they would sell their land if offered a high price. This influx of mostly wealthy people into the region will further skew the already unequal distribution in wealth. The local people will either be displaced or end up working for those foreigners who come in and start tourism businesses. They will no longer have land to farm and will become increasingly dependent on tourism. However, as we have seen in the case of Puerto Viejo, it is dangerous to become dependent on one source of income as seasonality and unforeseen disasters can interrupt the inflow of tourists.

Even without the new road, the youth in Agujitas have become especially dependent on tourism and many have not learned how to plant crops. Those interviewed did not express a desire to farm because they are able to earn better wages working in the cabins or driving boats. They feel that farming is much harder work with less return. The local people may be earning more money working in the cabins than they would be on the farm (local employees of the tourist lodges are currently earning approximately \$162 per month on average), but they would be making significantly more if they ran their own tourist operations (Interview, Pedro, Benita, Emiliano, 1992, store owner, Omar, 1993). However, it is extremely difficult for local people to start their own businesses. The Costa Rican government has done little in the way of incentives to enable Costa Ricans to open up businesses that cater to tourists.

If these policies continue, the local people of Agujitas will never obtain the wealth they could potentially earn and the tourism sector will continue to be dominated by foreigners. Profits from tourism will go to outside investors in resorts, tour operators from the capital city, and the lodge owners in Agujitas. This type of dependency on tourism is represented by economic growth that leaves an underdeveloped social structure or reinforces existing social discrepancies. The majority of the local people will continue to not participate in or benefit from the growth in tourism and only a few members of the community will actually gain from the experience (Murphy, 1985). There is also a good possibility that new and larger tourist operations would bring in much of their staff from the outside. This is already the case in many of the lodges where either English speaking foreigners or Costa Ricans are brought into the area to work as guides.

Tourism is not necessarily a panacea for economic development. As Eadington and Redman point out, "tourist demand can be highly unstable in response to perceived risks and uncertainties in travel associated with political turmoil, terrorism, epidemics, and natural disasters; it also can be highly seasonal in nature. On the supply side, tourism has not always been an effective employment generator and can be a capital intensive industry with a significant import content" (Eadington and Redman, 1991). Other economic costs of tourism include increased pressure to import agricultural goods because of increased demand, seasonality of tourism, problems connected with over-dependence on one product, unfavorable impact on the balance of payments, and heavy infrastructure costs (Lea, 1988).

4.15 Environmental and Human Health Consequences of a Road and Increased Tourism

As long as tourism continues to grow in Agujitas, so will the demand for more tourist services and accommodations. If hotels continue to be built in the coastal zone they

will dominate the coast with their beach frontages. Though illegal, beachfront development will eventually limit beach access to hotel guests at the expense of people not staying at the hotel such as day-trippers and local people (Smith, 1992). There is also the potential that future development will shift away from a more traditional village architectural form to more eclectic patterns and designs using brick, concrete, and steel as construction materials instead of the traditional lumber.

Pollution may also result from the growth of hotels if there is no plan in place to regulate sewage disposal. For example, in the case of beach resort development in Malaysia, marine pollution has resulted from an increase in the scale of resorts. A sewage treatment plant for a Malaysian resort was constructed, but this was at the expense of removing vegetation in the resort area. This has exacerbated the process of defoliation of the resort resulting from the increasing intensity of physical development, destroying the ambiance of the area that attracted tourists there to begin with (Smith, 1992).

While there is not a sewage problem in Agujitas to date, potential sewage pollution problems from increased development and the fact that the current system is located so close to the water have not been addressed by the community. Septic tanks and other systems of underground disposal of household sewage can be major sources of pollution when they are near water bodies. Three major problems that might result when systems are located close to the water are: 1) wastes can leach into coastal waters, 2) high water tables due to the tides flush drain fields into coastal waters, and 3) poor soil absorption or field components that cause tanks to overflow, especially during rainstorms, and pollute coastal waters. Clark argues that the "five major pollution problems from inadequately treated human wastes are 1) hazard to human health from pathogens in coastal waters and in shellfish, 2) aesthetic offenses, 3) oxygen reduction of coastal waters from biological oxygen demand loading, 4) eutrophication (over-fertilization) of coastal waters from release

of dissolved nitrates, and 5) poisoning of coastal waters by pesticides, heavy metals, and other toxins" (Clark, 1983)

Population growth in Agujitas in the recent past has been slow in relation to the large increase in tourism. However, tourism growth in the region will also attract more people to the region who see the opportunities tourism can provide. Subdivision of the land is slowly beginning to occur as people are starting to sell off a portion of their land to new settlers. A road will make the Agujitas region more accessible to settlers and this could accelerate this subdivision process. This will result in increased development and more pressure to convert land for agricultural and cattle ranching purposes.

A road will not only open up the region to increased tourism, but logging companies will have access to virgin forests, a rare occurrence in modern Costa Rica. Loggers have, until now, largely been absent from the Drake region, but it is expected that this would change rapidly if a road was constructed, linking this region to the rest of Costa Rica. When the Piedras Blancas-Rincon road was built down the south side of the Osa Peninsula in 1978, logging trucks moved in immediately (see map 2). Much of this side of the peninsula was rapidly logged and continues to be targeted by logging companies as most of the rest of the country's forests have been picked over (Fundacion Neotropica, 1991).

Saenger concludes that, "probably the single most important indirect effect of tourist developments worldwide is that of a decline in local water quality" (Clark, 1990). Any growth in tourism or permanent population will exacerbate the current water supply problem. Because Don Carmen sold his property, it is uncertain whether or not the community will have access to the same quantity of water. Don Carmen says that the community has a right to the water supply on his property by law. POZUELO currently

runs a large tourist boat down the Pacific coast during the dry season, anchoring in Drake Bay along the route. It is very possible that the company could decide to utilize their newly acquired land (140 hectares) for tourism purposes and build a lodge in Agujitas. Depending on the scale of such a project, this could severely affect the quantity of water available to the rest of the community.

One alternative source of water to the current supply on Don Carmen's property is the Agujas River, that empties out into Drake Bay (see map 4). However, many of the recent immigrants to the region have and will likely continue to settle along the river, clearing much of the land adjacent to the river to raise their livestock and plant crops. This will degrade the quality of the river water due to increased erosion from clearing land and livestock pollution. Continued watershed degradation would also reduce stream and near shore faunas, which would predictably lead to a long-term decline in artisanal and sport fishing. Since the local people rely heavily on fish as a source of protein, a decline in local catch would be detrimental to their nutritional well being (CCA, 1991). The community has not only failed to address current water supply problems, but has also not planned for any growth. If the community does not begin to plan for the future they may end up in a situation where they have lost access to the water supplies or those supplies might be of such poor quality that serious health consequences might ensue. Consequently, this might scare tourists away.

4.2 User Conflicts in Agujitas

There exists in Agujitas a conflict between those people who use the natural resources of the region to produce goods and those who rely on tourism. The area's tourism is based on the natural attractions and when these are diminished, potential for tourism is also damaged. As previously mentioned, tourists were concerned that

construction of a road into the region might ruin the ambiance of the area that attracted them to Agujitas in the first place. However, one problem is that many local people have received few, if any, economic benefits from tourism exploitation and consequently do not understand the importance of conserving an environment conducive to tourism. And often those who do rely on tourism do not make the connection between the importance of sound watershed management practices and coastal development in order to preserve the beauty of the area. This has resulted in degradation of the watersheds from logging, cattle grazing, and agriculture, and inappropriate shoreline development.

4.3 Law 6043's Effect in "Agujitas 1"

If Law 6043 continues to go unenforced in Agujitas and a regulatory plan is not prepared for the region, current problems will be exacerbated. The municipalities do not regulate if and where building can occur and it is likely that development will occur in areas not suitable for such use. Uncontrolled growth will have long-lasting and often irreversible negative impacts on the region. Phuket island, in Thailand, is a case in point. Due to rapidly growing tourism on the island, growth has far out-paced infrastructural development. This has created many severe problems including; shortfalls in basic services such as water supply, sewage and solid waste disposal, destruction of beach front vegetation to give way to hotels and bungalows, and reefs extensively damaged by boat anchors (Ausavajitanond and Bunpaong, 1991). Even if a regulatory plan is developed for Agujitas and Law 6043 is better enforced in the future it will continue to be mostly ineffective in protecting coastal ecosystems and managing development due to its limited scope. While the potential for large economic benefits from tourism is great and it is inevitable that coastal development will continue, it is necessary to have a more comprehensive regulatory regime, including effective land use regulation, in place before ill-planned expansion occurs (CEDARENA, 1992).

5.0 Agujitas 2

Because the rapid expansion of tourism and other potentially harmful coastal activities in Costa Rica is recent, there is still time to manage coastal zone activities to maximize economic benefits for the nation and its people and minimize environmental and social impacts. This is especially true for Agujitas as it is relatively pristine and tourism is currently smaller in scale than in other coastal towns in Costa Rica, rendering it a more manageable area to initiate coastal management strategies. However, government policies, institutional arrangements, legislation governing the coast, local perceptions and participation, enforcement mechanisms, and current land-uses will have to be modified and new management strategies must be initiated in order to achieve conservation and sustainable development of coastal areas.

5.1 Integrated Coastal Zone Management

One way in which current and future coastal management issues in Agujitas could be addressed is through an ICZM program. The following definition of ICZM was formulated by John Clark and other coastal experts from around the world who gathered for a workshop in Charleston, South Carolina to discuss the global status of coastal management. "ICZM is a dynamic process in which a coordinated strategy is developed and implemented for the allocation of environmental, socio-cultural and institutional resources to achieve the conservation and sustainable multiple use of the coastal zone" (Clark, 1991). ICZM is concerned with resolving conflicts among users of coastal resources and tries to determine the optimal mix of uses over time while recognizing the dynamic nature of both the resources and demands on the resources (Clark, 1991).

Objectives within a ICZM program will vary country to country and region to region, depending on the political, socio-economic, and biological characteristics in that particular coastal area. Several countries have not adopted ICZM in the formal sense, but there are components that are more or less universal to all locales. ICZM's inherent flexibility offers a country the ability to adapt it to its own specific situation (Clark, 1991).

Central to the idea of ICZM is integrating economic, technological, ecological, and institutional aspects into the coastal planning process. Community participation is also seen as a crucial component of ICZM to ensure that multiple uses of the coastal zone are addressed in the planning process and to maintain the longevity of the program. ICZM provides the village with a framework to identify, ameliorate, and mitigate problems in the coastal zone and guide development in their community. ICZM is, in reality, an expression of a means for regional and or national economic development with an emphasis on sustainability (Clark, 1991).

Sorenson, McCreary, and Hershman (1984) have suggested that ICZM programs using strategies such as land use planning may have better success if they are initiated on a regional basis for a trial period and then expanded into national land use planning. The risk and consequence of failure will not only be smaller on a regional basis, but the experience gained will also increase the likelihood of successful efforts on a national scale. In this case, a pilot project in Agujitas testing different strategies for coastal management would provide a model for other communities in the peninsula and elsewhere in Costa Rica.

It is important, however, that regional plans take into account national development policy. The Costa Rican government and experts in various fields drew up a conservation strategy for the sustainable development of the country in 1990 (ECODES), recognizing that the natural resources of the country are crucial to guarantee long-term sustainable

development. The report states that a tourist development plan should take into account economic, social, cultural, and environmental variables when planning for tourism development (Mateo, 1990). The national government has recognized that the tourism industry is particularly dependent on a healthy environment, but admits that to date there has been no tourism development plan with a long-term vision. In particular, ECODES points out that an authority in charge of planning, regulating, and controlling coastal resource use has been absent (Mateo, 1990). The ICT's emphasis has been on promoting tourism rather than protection of coastal resources. ICZM provides a framework for more closely linking national tourism and development policies with environmental policies.

5.2 Tourism as a Form of Sustainable Development?

Economics plays a key role in ICZM. When poverty exists, people are forced to do things that they know are not sustainable (e.g. farming on marginal lands). On the other hand, wealthy investors also may do things for short-term economic gain instead of maintaining the integrity of the resource. As Clark points out, "part of the difficulty lies in the conflicting temporal and spatial scales associated with current perceptions of resource problems and economic opportunities. Temporally, resource problems are long-term management concerns while profit opportunities are usually perceived of as being immediate. Spatially, resource problems transcend typical man-made boundaries, while economic opportunities are usually site specific, but with regional or national implications" (Clark, 1991).

Tourism can bring long-term tangible economic benefits to a community and the host country if managed in a sustainable manner instead of viewing the industry as a source of short-term gain. Tourism must be recognized as an environment-dependent source of income and development will change the resource base and affect the lives of the

community (Clark, 1990). Visitor expenditures in the host community are only the first stage of the economic impact on the village. Tourism's contribution can multiply as the extra income passes through the economy. This multiplier concept is defined by Eadington and Redman (1991) as "the ratio of total income or expenditure changes (including the initial tourism induced changes) in a region to the changes in income or expenditures directly attributable to tourism". The more self-sufficient a community is in providing tourist facilities and services the less need there will be to import and so more revenue will remain in the community to be reused by the residents (Murphy, 1985). In addition to calculating the multiplier effect, there are other economic impacts tourism has on the national and local economy that merit attention. These include; a contribution to foreign exchange earnings and the balance of payments, the generation of employment and income, the improvement of economic structures, and the encouragement of entrepreneurial activity (Lea, 1988).

5.20 Ecotourism

Unplanned, large-scale tourism can have severe negative impacts on villages and the surrounding environment as outlined in "Agujitas 1". One alternative to tourist blight might be the increasingly popular environmentally sensitive tourism or "ecotourism". Ecotourism has been used to describe several different types of tourism, leading to much confusion over the true meaning of the term. The Ecotourism Society has defined ecotourism as :

- "purposeful travel to natural areas;
- to understand the culture and natural history of the environment;
- taking care not to alter the integrity of the ecosystem, while;

- producing economic opportunities that make the conservation of natural resources beneficial to local people" (Ecotourism Society, 1991).

Ecotourism in this sense is not only valuable in environmental education, recreation, and aesthetics, but also protects plant and animal life by giving local people economic incentives to preserve the environment. These incentives include the direct or indirect creation of jobs and the introduction of basic services such as electricity, telephones, roads, health services, and schools. Ecotourism is also attractive in that it requires a relatively low investment since it favors rustic accommodations over the luxurious.

Despite the increasing importance of ecotourism in Costa Rica, the government has not proclaimed any formal policy statements that refer specifically to ecotourism (USAID, 1992). The ICT and MIRENEM signed a formal letter to cooperate in developing tourism in protected areas, but plans for joint efforts have mostly fallen through. Some incentives for private sector ecotourism projects have been created. These include duty-free importation of machinery and equipment. These incentives, however, apply to a wide variety of investments and are not available to everyone. For example, a non-governmental organization that establishes, protects, and manages a reserve that generates tourism does not qualify. There is a need to offer incentives to support non-governmental organization and community based conservation (USAID, 1992).

5.21 Village-Based Tourism

One specific form of low-impact tourism beneficial to both the environment and destination communities is "village-based" tourism (Place, 1991). This model of tourism was tested in a project called "Tourism for Discovery" in Senegal. It involved simple lodgings built, managed, and operated by the local people. Though the accommodations

were modest, this provided the opportunity for more interaction between the tourists and the hosts. Tours were made available to show the traditional way of life and educate on the surrounding environment. Lodges were constructed using traditional methods and materials and local products were used to make the food, keeping the costs of construction and services down. Cooperatives were formed to run the lodgings and also to allocate the profits at the end of the year. Although this project had its share of problems, it has enjoyed overall financial success and cultural exchange between the guests and hosts (deKadt, 1979).

Village-based tourism might be one way of directly involving local inhabitants in Agujitas in tourism. Because of their knowledge of the history, local customs, flora and fauna of the area, local people could be excellent tour guides. Restaurants run by locals could provide visitors with a taste of local customs and foods. However, village entrepreneurs need seed money and, in many cases, small-business management and other training to implement these projects. The community could potentially require business licenses of all outside operators, charging fees and a percentage of their profits. While this fee should not be too high (to avoid pushing entrepreneurs to other tourist areas), the revenues could be used to start and maintain a revolving fund for community development and education projects (e.g., environmental education, medical assistant) and provide loans to locals to establish their own businesses. These funds could also be used towards purchasing a larger, faster, and more secure public boat. This could provide an alternative to opening up the road, mitigating the long-term adverse effects a road could have on the community and the coastal environment. (Lee, 1990).

5.3 Economic Diversification in Agujitas

While tourism will continue to be a significant contributor to the local economy, it is important for Agujitas to diversify the local economy to reduce its dependency on tourism. One possibility would be to increase agriculture on those lands suitable for such use and sell the crops to the local people and lodges. According to Grober and Fernald, there is land in the Agujitas region that could be used for agriculture, but is in pasture or idle at this time (Grober and Fernald, 1992). Currently, the supply stores and lodges bring their produce in by boat from Sierpe. This is not only costly, but sometimes the food spoils before it can be used. As a result, owners of the supply stores and lodges said they would welcome locally grown produce (Interview, store owner, 1993). It is important for the community to reduce its need for food imports to sustain the tourism industry and local population.

Another possible source of income for the local people is small-scale fishing. Locals felt that this is a good idea though they also point out difficulties. They contend that 1) not many people know how to fish, 2) not everyone has a boat or access to one, and 3) there are many areas directly offshore that are protected and prohibit fishing (Interview, Sergio, Pedro, Omar, 1993). While this would not be a viable source of income alone, it could supplement other income. Not only could they sell their catch to the lodges, but possibly to nearby regions.

Although many properties in the region fall within the Forest Reserve, it is possible to practice sustainable forestry on these lands if permission is obtained from the DGF. Promotion of sustainable forestry is one of the main components of the BOSCOA project in the Forest Reserve. The overall purpose of BOSCOA is "to develop and demonstrate natural forest management, sustainable agriculture, ecotourism, and biodiversity

technologies which are economically productive and contribute towards the maintenance of forest cover on the Osa Peninsula" (Bauer, 1992). While this project does not currently cover Agujitas, it should be considered as a possibility for the future. Meanwhile, technical assistance to residents of Agujitas would aid them in practicing sustainable forestry on their lands.

The women's cooperative in Agujitas currently meets a couple of times a month on weekends to work together on producing a range of different quality handicrafts. These include hand embroidered tapestries called "*molas*", hand carved gourds with typical scenes of the local people's everyday life, and jewelry made by hand from local materials such as coconut, mother of pearl, and tropical woods. The handicrafts are sold in most of the lodges or they can be bought directly from the women in the village. The cooperative produces a fairly large quantity, more than will sell in the lodges. One option would be to expand the market of these handicrafts and export them to the capital to be sold. This would provide extra income to the women of the village as well as give them a sense of pride in their culture and work. It is possible for all of these economic alternatives to co-exist, enabling the community to lessen dependency on tourism.

Since the local people clearly rely on a healthy environment to support all of these economic activities, it is crucial to take bold steps to protect and conserve these resources to maintain a productive local economy. Ecotourism is supposed to advocate environmental conservation by "stepping lighter" on the environment and discourage destruction of natural resources. However, because the term has been misused in many instances as a marketing tool to sell tours, other ways to ensure that natural resources are not overused must be addressed (Clark, 1990).

6.0 Implementation of Integrated Coastal Zone Management

6.1 Regulatory Plans

Regulatory plans are an important aspect of Law 6043 and can serve as the basis of an ICZM program. A regulatory plan is a design for locating development and activities within the context of the natural resources of the coast. It is an effective way to manage coastal resources because it establishes a framework that can resolve conflicting resource needs, address potential pollution problems, encourage the protection of natural resources, and maintain the traditional aspects of communities. However, there are critical components to coastal resource planning that traditional regulatory plans have ignored. These include; community participation in the planning process, watershed regulation, education, economic alternatives, and flexible growth management tools.

Clearly, Agujitas needs to ensure that new development in the coastal region is compatible with sustainment of its biological and aesthetic resources, which are the basis for the expanding tourist economy and local peoples' subsistence. However, no integrated framework exists for making public policy nor is there a central, clearly stated goal or shared vision of what Agujitas should become. Private organizations and government agencies continue to establish their own policies, whether or not they conflict with the general public interest. It is important for Agujitas to have a regulatory plan that would describe regional policies, strategies, and institutions for the region as an integral component of national economic planning. Only with a sound regional plan can the further development of Agujitas be better coordinated with national development planning and policy objectives. Agujitas has a rare opportunity to take a proactive stance in protecting its natural resources through formulation of a plan since it is still in the initial, but formative stages of the development process.

6.2 Preparation of Regulatory Plans

6.20 Actors Involved

It is important to identify the actors who might be affected by or might participate in ICZM and preparation of a plan and it is crucial that connections be made between these different groups. There should be linkages between complementary government offices and agencies, diverse interest groups should be brought together, and information to policy makers, various parties at interest, and the public should be assured. The program should try to integrate those economic and social sectors with a stake in coastal resource use and build a constituency for ICZM to sustain the management activity (Clark, 1991). Stakeholders in the development of Agujitas include the local people and existing organizations, local and national government, tourists, non-governmental organizations, and international governmental and non-governmental organizations.

6.21 Existing Organization and Initiatives

Existing groups and community action plans in Agujitas should be integrated into the program and consensus building among these groups should be emphasized. This will help to avoid future conflicts and ensure more cohesive support for the program.

Other agencies and organizations with a stake in the future of the region or currently regulating activities in the coastal zone must be included as well. This will not be an easy task as there are many jurisdictions in the coastal zone. David Freeman points out that "indeed it could be argued that the failure, or refusal of a country such as the UK to adopt an integrated approach to coastal zone management is precisely because of the difficulties of disturbing the plethora of institutions which already regulate activities in coastal areas"

(Clark, 1991). In addition, the planning process should not only include steps that help to integrate concerned agencies into plan preparation before implementation, but must also identify clearly the area over which the management authority will be able to exercise direct administrative and regulatory powers (for the granting of permits, concessions, etc.) (Clark, 1991).

6.22 Decentralization of the Decision-Making Process

Government authority over state coastal management programs in the United States has become increasingly decentralized. However, this experience is not as transferable to developing countries as it is to developed countries. Developing countries, such as Costa Rica, lack strong regional or local governments and skilled personnel and it is unlikely that complete decentralization policies will be successful. (Mitchell, 1986). On the other hand, the national government should not attempt to run the whole program. The collaborative planning paradigm argues for the importance of maximizing citizen participation, decentralizing planning authority, and opening the planning process. The premise of this paradigm is that officials and planners do not necessarily have a better perspective of the locals problems and their best interests (Godschalk, 1971). Instead it should work with the municipality and local associations to bolster the ability of local government to evaluate development proposals, enforce regulations, and positively guide development so as to achieve the purposes of the local regulatory plan. Government institutions can expand municipal land management capacity by providing technical assistance, information, and, where necessary, financial and/or legal assistance.

6.23 Community Education and Participation

Obviously the biggest and most direct stakeholder in Agujitas is the community itself. The community needs to realize that a deteriorating environment is not a necessary cost of improving other living standards. Residents must recognize the fragility of certain resources and protect their resource base if they are to develop a long-term industry from tourism (Murphy, 1985). There is a need for a community outreach program based on educating people about tourism, its economic potential, and alternatives to tourism. In order to achieve ICZM, the attitudes of both locals and visitors will have to change from that of consumption to conservation. If it succeeds it will help improve both the economy of the nation and local communities by maintaining the biodiversity and sustainability in coastal communities in Costa Rica.

Residents of destination areas should not only be educated on the socio-economic benefits of tourism, but tourism planning should be based on the overall development goals and priorities of the community (Murphy, 1985). Usually planning and promotion of tourism has been top-down and the community has had little input or control over its development. Centralized planning can cause hostility and resistance if plans for development do not fit in with community goals. This will threaten the tourist potential of an area since tourism relies on the goodwill of the local people since they are part of its product (Murphy, 1985). Any plans made will also be undermined without the support of the community to sustain it. It is therefore critical to the success of ICZM to involve residents in the actual planning process (see Appendix 1). This may increase the time and effort of professionals to complete a project, but more reliable and useful information will be obtained and the confidence and support of the community will be gained.

6.24 Approaches to Community Participation

In the literature concerning community involvement in projects, many approaches to involving local people have been suggested. Brandon, Hannah and Wells (1990) offer two approaches in particular: the beneficiary approach and the participatory approach. They have defined the beneficiary approach as one where "Development is perceived as providing benefits, without depleting the biota of the protected area. People receive benefits which they have no more than a limited role in generating; their role is best described as 'involvement' rather than participation. End products are tangible economic benefits". The participatory approach, on the other hand, is defined as one in which "Development is perceived as a process of empowering people and improving their ability to control their own lives and their use and management of resources. The project acts as a catalyst seeking to stimulate a spirit of self-reliance among the poor and underprivileged. This approach emphasizes the role of local institutions, both formal and informal, in providing people with the means to take control over their own lives" (Brandon, Hannah, and Wells, 1990).

6.25 Participatory Rural Appraisal Methodology

An alternative to centrally planned and externally managed development and planning efforts is Participatory Rural Appraisal (PRA). The methodology used in PRA is a unique, village-based participatory (versus beneficiary) approach to development. It aids communities in supporting activities that they design and implement for sustainable production in the community. It also strengthens local leadership and institutions. The first stage in the process is accomplished through field work by planners and the community to compile geographic, socio-economic, and ecological information on the region. This will help planners and the community begin to identify existing and potential needs and or

problems to start defining planning and development priorities, approaches, and environmental protection measures (Asamba, 1992). It is crucial that a development strategy for Agujitas stem from the image the locals have of their own needs and development possibilities.

A. White and C. Thia-Eng have learned several lessons in their experience in the Philippines in regards to community participation in the country's ICZM program:

- Local participation is crucial in the planning process to ensure acceptance of the plan and to tap the maximum information, held locally but not published, and promoting confidence of the local policy makers; but over-enthusiasm by the local planners has potentially created expectations among local officials that cannot be fulfilled by the ultimate plan implementation.
- Allowing the local decision makers to own and take responsibility for the plan formation has helped to ensure stability in the process of planning and pre-implementation" (cited in Clark, 1991).

The second stage is to hold a meeting with the whole community. It is important to grasp the relationships that exist between various social groups, the power structure, and who is making the decisions in the community. This should be accomplished before holding these meetings to try to head off possible conflicts. Meetings would bring the community together in a forum to discuss problems in the community based on the data collected by the PRA team. The objective of the meeting is to define current and future planning and development needs and associated environmental issues. This will enable the community to begin ranking priorities and defining approaches to solving current and potential problems (Clark University, 1991).

Even in a community as small in size as Agujitas, there are going to be differing views on a variety of issues. While PRA does not bring answers or solutions, it does contribute a process of dialogue and encourages larger numbers of community members to participate (Asamba, 1992). An important criterion in these meetings is fairness: competing claims of affected individuals and interest groups should receive equal consideration in the decision-making process. The planning process may be lengthened by this accommodation, however this may generate more support for the overall project and also avoid adoption of inadequate or unimplementable solutions (Cernea, 1983). These meetings are designed to be participative, practical, learning experiences that will build the community's capacity to be more self-reliant and better able to address similar issues in the future (Kettering, Schmidt, and Silverman, 1986).

As discussed previously, most of the residents of Agujitas do not have a positive attitude toward the local development association. The locals seem to have little confidence in or respect for the president of the association. While it is important to gain the support of the association and involve it in the planning process, the community will probably be less likely to fully participate if the association ultimately controls the decision-making. In the case of Agujitas, it would make sense to form a temporary village committee that would represent the community at large (see Appendix 2). This village committee would be comprised of a couple of representatives from each of the organizations in Agujitas (including the development association) as well as local people not involved in any groups, but elected to the committee by the community. Most of the meetings should involve the community at large, but the village committee could serve as representatives of the various groups in Agujitas. It is also necessary to have at the meeting representatives of the various government and non-governmental organizations and that are outside of the village, but involved in the planning of Agujitas (Clark University, 1991).

Based on the findings in the first meeting, the third stage will involve bringing together the village committee, planners, and other organizations' representatives to begin developing a strategy for an ICZM project in Agujitas. The basis of this program will be a regulatory plan consistent with Law 6043, but going beyond the current provisions. Once the strategy has been developed it will be presented to the community at large for further refinement (Clark University, 1991). It is likely that even after going through this process there will still be discontent among some local people. While it is important to try to accommodate as many people as possible it is usually impossible to please everyone. In this situation, a clear harmony of interests from the majority (at least two-thirds) of the affected people must be obtained in order to make a final decision (Urban Land Institute, 1978).

Public participation should not end once a strategy has been adopted. Continued community involvement in the implementation and monitoring of the program will be crucial to its success (Clark University, 1991). Once the plan is adopted, the village committee, local institutions, and external assistance will begin the implementation process. As the World Bank points out, "giving communities formal rights to monitor the program and information needed to do so, as well as access to political leaders to communicate their findings and to voice complaints...is a tangible form of empowerment making participation more meaningful" (Cernea, 1983). In addition to local empowerment, there are several other needs that must be met for effective village implementation. These include; 1) sound technical advice, 2) project materials, skilled labor (training), and 3) administrative backing (Clark University, 1991). CEDARENA, ACOSA, BOSCOSA, national and international funding agencies and the government will be responsible for providing these needs.

6.26 Tools and Techniques for Growth Management in Agujitas

Once all necessary studies have been completed (e.g. land use capability analyses) and the community's goals and objectives have been defined and outlined in a regulatory plan, specific growth management tools and techniques can be utilized to realize the community's and ICZM objectives as outlined by the plan. These might include multiple use strategies, traditional zoning, flexible regulatory techniques, and carrying capacity analyses. These tools and techniques can influence the following characteristics of growth:

- The quantity of development
- The type of development
- The cost of growth, including economic and environmental costs.
- The location of development
- The timing or rate of growth
- The quality of development
- The density of development (Brower and Carol, 1984).

In addition, these tools can help to mitigate some of the social impacts of development. In choosing the most appropriate tools and techniques the community should review them in relation to; 1) the technical and administrative expertise available to the Agujitas, 2) the local political situation, 3) the legal status of the tool or technique, 4) the growth situation in Agujitas, and 5) the financial resources of the community (Brower and Carol, 1984).

6.260 Multiple Use

Multiple use is a strategy that recognizes that a limited supply of land may need to be used for several purposes. Traditionally, management and development in coastal

regions focused on only maximizing the production of a few resources. As a result, much of the resource potential of natural systems is passed up, resulting in lost economic and social development opportunities for the local people. The way to sustain social and economic benefits from the multiple functions of coastal ecosystems is to adopt management and development strategies that maintain the integrity of the ecosystem. One way to ensure this is through environmental assessment of the area that focuses on the abilities of environmental systems to support different levels of development and management strategies (Burbridge, Clark, and Dankers, 1989).

A regulatory plan would determine land use capability based on a land-use classification system and could form the basis of land-use planning for the community. Although a few limited land-use capability studies and environmental inventories have been carried out in the region, there is a need for a more thorough understanding of the natural systems in order to develop a land-use plan for the village that allows for multiple use of available resources. These diverse uses include agriculture, cattle grazing, sustainable forestry, tourism, fishing, and extraction of minor forest products (e.g. construction and handicraft materials).

6.261 Zoning

Regional planning will provide an opportunity to achieve environmental protection goals through use of zoning strategies. The local residents should determine the type of land development they wish to encourage, protect, and develop, and then tailor the community's comprehensive plan and zoning ordinance accordingly. There are a number of potential uses that compete for space and resource use in the coastal zone. These include; transportation, housing/lodging, commercial development, recreation, agriculture, livestock, fishing, and protected natural areas. Many of these are not compatible with each

other- hence the need for land-use planning. Zoning can offer a viable method to minimize user conflicts and environmental stress (Murphy, 1985). Under this concept, areas will be zoned according to their suitability for proposed uses based on land-use capability analyses (Odum, 1976). Zoning strategies and regulations can be used to direct concentrated development in some areas and dispersed development in others depending on the suitability of the environment. Fragile environments would be given the most rigid protection (Inskeep, 1987).

While there is no law in Costa Rica mandating zoning in the country, DEPPAT S.A. (a private Costa Rican architectural firm) has developed several regulatory plans in Costa Rica and these plans have included zoning categories. These categories will be more applicable to the situation in Agujitas than those which have been developed in other countries. Land-use in the Agujitas region could be divided into:

- Public zone: This is the first 50 meters from ordinary high tide that will be open to the public as defined under Law 6043. No concessions will be given in this zone.
- Green zone: community services and parks;
- Absolute conservation zone: Only conservation and protection of natural resources will be permitted in this zone. This would include buffer zones in the watershed that protect critical resources (e.g. streams).
- Agroforestry zone: This zone allows for cultivation of fruits, trees, and other crops with the objective of supporting tourist development and maintaining subsistence levels of food.
- Low density tourist zone: This allows for hotel and restaurant projects and other necessary facilities to meet the demands from small-scale tourism.
- Tourist camping zone: This would allow for areas in which tourists could pitch their tents. Toilets and showers would be permitted in this zone.
- Tourist facilities zone: Areas set aside for sports activities. Bathrooms are permitted.

- **Transportation zone:** This includes runways, roads, trails, and boat docks (DEPPAT, 1988).

An additional category that should be included in the zoning is the Restricted zone. This is the 150 meters inland after the public zone under Law 6043. In this zone no construction will be allowed except for those activities that must be situated next to the sea (e.g. boat docks or ramps down to the water).

Odum points out two basic requirements for successful implementation of environmental zoning: 1) "need a strong legislative and administrative organization with the authority to create, maintain and enforce zoning regulations; and 2) there must be a sound method for determining the basis for zoning decisions. These decisions are necessarily of a political nature, but they must be based upon fair and accurate considerations of economic, ecological and aesthetic factors" (Odum, 1976). Enforcement of zoning would be the responsibility of the agency with overall supervision of the coastal management program (the ICT currently has this role) and the municipality. The local development association and members of the village committee would serve as watchdogs and would be expected to report any violations to the ICT and municipality.

6.262 Flexible Growth Management Tools and Techniques

In addition to the conventional approach to growth management and resource conservation using zoning categories, there are several other tools and techniques that have been utilized in the United States and other countries. Most of these options have been unexplored in Costa Rica. Many of these are flexible devices that could be applied in Agujitas in specific situations where rigid regulations may not work or be accepted. These include performance zoning, shoreline setbacks, buffer zones, exclusion zones, restrictive

covenants, moratoriums on development, planned unit developments, subdivision controls, and annual building permit limits (Brower and Carol, 1984). It would be necessary to institute national legislation to enable application of these tools and techniques.

Performance Zoning: Performance zoning sets standards based on permissible effects of development instead of listing those types of activities that are permitted in the zone. This form of zoning can be used as a system to protect natural resources and environmentally sensitive areas. The performance control is designed to preserve natural processes by permitting acceptable development that does not upset these processes. For example, in Agujitas, the community could specify a permissible level of water pollution before it threatens human health and the environment. All new development would have to be compatible with the level specified in the regulatory plan (Brower and Carol, 1984).

Shoreline Setback/Buffer Zones/Exclusion Zones: Since coastal environments are dynamic in nature, it is important to plan for both natural and artificial change. This may be done using concepts such as setbacks, buffer zones, or exclusion zones. These are regulatory tools that prohibit or significantly limit certain uses within a delineated band in the coastal zone. The objective of using these zones, as outlined by Clark include "1) avoidance of damage from flooding and erosion, 2) protection of ecological functions, 3) protection of public access or public views to the shore" (Clark, 1991). These are particularly applicable to Agujitas as the area often experiences a high degree of flooding and erosion during the rainy season. A study should be carried out in the region to determine those areas that are susceptible to erosion and identify where setback, buffer, and exclusion zones are needed in Agujitas. As the community continues to grow, these zones can also help to assure continued access to the shore and public views. Shoreline exclusion, setbacks and buffer programs are attractive management tools because they tend

to be "inexpensive, geographically precise, and offer clear guidance about prohibited uses" (Hershman, McCreary and Sorenson, 1984).

Restrictive Covenants: A restrictive covenant is a private agreement between a landowner and the person who acquires that property. These usually create negative easements that govern how the land can be used. Restrictive covenants can be an important land use control mechanism (Brower and Carol, 1984). One type of restrictive easement is a conservation easement. CEDARENA has already begun drawing up conservation easements for private property owners in other areas on and off of the peninsula. Conservation easements are an effective way of assuring that land will not be environmentally degraded by legally binding current and future owners of the property to use the land in the way specified in the agreement (CEDARENA, 1992). In Agujitas, this might ensure that land is not further deforested and sensitive lands are not developed. In particular, foreigners who own land in the region might be convinced to put their property under an easement since many of them claim to support conservation. Giving title to land to local people might be an incentive for these landowners to sign legally binding contracts.

Moratoriums on Development: Moratoriums on development are not meant to prohibit development altogether, rather they serve to substantially slow down the development process. Moratoriums can be useful in slowing or freezing development until planning and controls can be devised and implemented. They can also curb the stress put on the environment due to rapid growth. In Agujitas, a moratorium on development would help to take development pressure off of the community until a regulatory plan is in place (Brower and Carol, 1984).

Planned Unit Development: Law 6043 currently promotes diffusion of development along the shoreline that would seem to inevitably impact sensitive areas outside jurisdiction of the

law. Cluster zoning is the simplest form of planned unit development. It allows developers to build units closer together so as to leave open space and avoid sprawling development. It would also encourage protection of sensitive areas on properties by concentrating development in appropriate areas (Brower and Carol, 1984).

Subdivision Controls Relating to Off-site Facilities: Subdivision regulations control the process of converting land into building sites. They can establish requirements for the developer to provide for public improvements such as sewage facilities and drainage pipes to expand the capacity of the village to absorb more growth and to protect the environment. This would assure the community of Agujitas that it would not have to bear the burden of providing the additional infrastructure. It might also ultimately discourage more development (Brower and Carol, 1984).

Annual Building Permit Limits: The village can limit development and population growth by setting a quota on the number of building permits it issues under the regulatory plan. This will decrease pressure on the environment by reducing the pressure to develop and the rate of growth in the community. Development could also be controlled by putting stringent conditions to be met before a permit is issued (Brower and Carol, 1984).

6.263 Carrying Capacity

The assessment of carrying capacity is another method that controls for development by relating characteristics of development to the quality of the natural and social environments (Wyman, 1983). The concept of carrying capacity means different things to different people. However, an operational definition proposed by Godschalk and Axler can be adopted that links three types of capacity. These are:

- Environmental - the limit at which human activity will lead to undesirable changes in the environment.
- Perceptual - the amount of activity or degree of change that can occur before we perceive the environment to be different than before.
- Institutional - the ability of organizations in an area to guide development toward public goals (Godschalk and Axler, 1977).

Social carrying capacity is also important, particularly in Agujitas, since the villagers rely heavily on tourism that can bring both benefits and costs to the local population (Clark, 1990). Case studies have shown that communities will have a greater tolerance for tourism and visitors if they perceive more individual and community benefits and have a hand in the development and design of tourism in their community (Murphy, 1985).

There are few planning methods that allow one to handle the idea of carrying capacity and planners have had difficulty in working with the concept. This is due to difficult factors such as the definition of carrying capacity, its measurement and methodology which are different depending on which component of the definition one is addressing (e.g. environmental, perceptual, or institutional carrying capacity). Nevertheless, recognizing these limitations, the concept of carrying capacity can be a valuable planning tool. It can establish a threshold beyond which growth can only be tolerated if public investment or new institutional arrangements are established (Wyman, 1983). It can provide a framework for analysis and assessment that could be used to make more informed decisions (Murphy, 1985). Clark argues that "Carrying capacity should not be considered as negative because it is use oriented and is a balancing mechanism. It's purpose is to promote long term sustainability of the resource" (Clark, 1990). Current planning capacity is not a substitute for a comprehensive planning process, but is an

additional tool which can be used with current planning and zoning or as an integral part of a comprehensive growth management program (Wyman, 1983).

7.0 Recommendations for Conservation and Sustainable Development in Agujitas

The "Agujitas 1" scenario and preliminary thoughts for "Agujitas 2" were presented to residents during personal interviews in Agujitas. Their reactions to the two future scenarios of their village varied. Some local people had not given much thought to the potential problems associated with uncontrolled growth and development. Others were not surprised by "Agujitas 1" and agreed that problems are likely to occur. In general, residents offered very few suggestions as to how to mitigate negative impacts in "Agujitas 2". However, when the components and objectives of a regulatory plan were explained, all of the local people were receptive to the idea and felt a regulatory plan would benefit the community.

Regulatory plans are an important aspect of Law 6043 and should continue to be the basis of coastal zone management planning. However, a departure from a traditional regulatory plan to a regulatory plan based on ICZM priorities can help to help ensure that Agujitas develops in a sustainable and equitable manner while maintaining the integrity of the coastal environment. Economic diversification, village-based tourism, employment of PRA as a method of increasing community participation in the planning process, and a wider variety of growth management tools and techniques are important components of coastal management planning and should be addressed in the plan for Agujitas as well as other coastal areas in Costa Rica. Other recommendations to achieve conservation and sustainable development in Agujitas include:

- **Technical assistance and land-use planning** that stress small-scale development can greatly help the people of Agujitas. A regulatory plan can help to ensure that the environmental and perceptual carrying capacity of the region is not exceeded. Developable land area should be determined based on land use capability analyses and historical information. Any construction should be small in scale and use local materials to blend in with the landscape and maintain the aesthetic character of the area. Construction should avoid destruction of vegetation and planting of trees and plants should be encouraged in areas denuded of vegetation. As much open space as possible should be maintained to avoid overcrowding, provide public access to the beach, and grant areas where the public can recreate.

- **Adequate infrastructure** in the community is important to support more growth and improve the current standard of living. Priority should be given to bringing in a full-time medical assistant, improving the school's classrooms and teaching materials, provide a police officer or guard for the community, provide electricity to all homes and lodges, and possibly construct a future high school for the Drake region. Not only should the current sewage system be upgraded and sufficiently setback from rivers and coastal waters, but any increase in population will require expanded sewage treatment capacity.⁵

- **Water quality and quantity problems** must be addressed by the community. The village must either protect current and potential water supplies or look at viable alternatives. One way in which current and potential surface waters supplies could be protected is by assuring forested buffers along the rivers and streams or by requiring through zoning a certain distance between agriculture and the supply. The application of Forestry Law No.

⁵ "The disposal or absorption field of a septic tank system should be set back at least 150 feet from the annual high-water line to minimize nitrate pollution. However, whenever possible, a setback of 300 feet should be required" (Clark, 1983).

7174 of July 16, 1990, should be promoted on both private and public land to guarantee protection of the rivers. This would involve a minimum 50 m wide buffer to protect water quality and riverside vegetation (CEDARENA, 1992).

If unprotected surface waters continue to be the primary source of water, then a small chlorination station should be installed to disinfect the water supply and provide a chlorine residual. Another possible alternative would be to construct a well in the village. Positive points of this include a more stable source of water as a well will not dry up in the dry season. In addition, it will not be necessary to be concerned about treating the water as one would surface water since there most likely will not be a problem with turbidity and contamination. The negative points are that a well takes more inputs and capital, more energy, and someone to run it (Grober and Fernald, 1992).

- **Construction of the road** should at least be delayed until a regulatory plan is formulated. This will enable the community to prepare for the impacts a road will have on the region, ensuring that growth demands are met and potential conflicts and problems are mitigated. The community needs to weigh the long-term costs and benefits of a road. If a road is not built into the area, development of the Agujitas region and clearing of forests will most likely proceed at a slower pace and put less pressure on the natural environment. Tourists will continue to visit the region, paying extra to experience a unique and more pristine area of Costa Rica. However, if the road is not built, safer and cheaper public transportation should be assured (e.g. large public boat).

8.0 Recommendations for Law 6043

The current coastal law, Law 6043, has failed to ensure that communities, such as Agujitas, can successfully protect coastal resources and plan for sustainable development.

And while it promotes tourism, providing some income to the local people, the majority of the profits have fallen into the pockets of a small part of the local population in Agujitas or outside tour operators. Several modifications and additions will have to be made to Law 6043 and additional measures must be taken to control for coastal resources and development problems in the future.

- **Law 6043 must be modified** to broaden its scope. The ICT and INVU are given authority to control residential and tourism development any distance inland that might affect the ZMT. However, the 200 meter provision should be extended inland to encompass other activities in the watersheds (e.g. mining, farming, livestock grazing, logging) that influence the coastal zone, but are not regulated by the ICT or INVU. The law should also include offshore activities that take place within 500 meters of the coastline in order to integrate coastal land and coastal waters management (Sorenson, 1990).

- **Better institutional arrangements and coordination** to implement Law 6043 should be ensured to increase the effectiveness of the legislation. Ideally, a single agency would be in charge of Costa Rica's coastal zone management program. If the ICT continues to head the program, its budget must be reassessed to allocate more resources towards regulation rather than promotion of tourism. ACOSA was created by the Ministry of Natural Resources, Energy and Mines (MIRENEM) in an effort to decentralize the system of National Parks and Reserves, creating conservation areas in different regions in the country, and one for marine parks. Each area is managed, in part, by committees comprised of representatives of MIRENEM, community organizations, and non-governmental organizations. This has set an initial precedent for inter-institutional coordination for land-use planning on a local level, encouraging direct participation of local people. This approach could be extended to coastal planning and ACOSA could be a potentially effective government agency to carry out a coastal management program in place of the ICT.

- **An inventory of the legal status of coastal lands** is a critical first step towards improving coastal management since the administration and development of lands within the ZMT is contingent on whether the land is designated public or private. Because no such inventory exists, it is often unclear as to where Law 6043 should be applied and who should exercise jurisdiction. An inventory of coastal lands would bring the government up to date on which lands it owns and which are private. This would not only clarify where Law 6043 applies, but might also identify all public lands for the government and municipalities and provide them with additional revenue from concessions (CEDARENA, 1992).

- **Better enforcement** of the law is necessary. Officials of municipalities must visit areas under their jurisdiction more frequently. They might be more encouraged to visit areas under their jurisdiction if land is titled and they can collect additional revenues from concessions. Additionally, local judges must be better educated on Law 6043. A technical manual on Law 6043 should be provided to local judges to aid them in their decision-making.

- **Current loopholes in the law must be eliminated.** These include the exclusion of mangroves, estuaries, national parks, and refuges. The law assumes that designation of areas as national parks and refuges would provide these areas with sufficient protection. However, this has not been the case as no management plans have been drawn up for new parks and refuges. For example, in the Gandoca-Manzanillo refuge on the Atlantic coast, houses were built without any control within the 50 and 200 meter limits. Law 6043 needs to be amended to require management plans prior to the expansion of national parks and refuges (Sorenson, 1990).

- **Regulatory plans/schemes** should be carried out for the rest of the coastline. Firstly, priority areas for conservation must be identified and regulatory plans should be developed for these areas. This will require more of the ICT's budget be allocated to staff to develop these plans. Regulatory plans/schemes should also include some of the recommendations made in this paper to increase their effectiveness. In addition, an evaluation done of the regulatory plans already in place should be carried out to assess the effectiveness of the plans already in place.

9.0 Conclusion

In the last few years, Costa Rica has become one of the prime tourist destinations for people from around the world. Many visitors have been attracted to Costa Rica because it is viewed as a relatively safe and easy country to travel in as compared to other Latin America countries. It has also received a tremendous amount of publicity as a developing country dedicated to conserving its natural resources. The 34 national parks and refuges in the country are target destinations for tourists who wish to view the diversity of flora and fauna that is typical of the tropics (Mateo, 1990). While it is undeniable that Costa Rica has made important steps in conservation, there is still much room for improving protection of the many diverse resources this tiny country contains. People are beginning to realize that environmental problems cannot be viewed as isolated problems and understanding their inter-connectedness is crucial to designing management strategies that will effectively address and resolve the issues. This approach to conservation outdates Costa Rica's coastal management program.

Costa Rica's coastline can no longer be viewed in isolation to off-site environmental problems nor can institutional weaknesses be allowed to continue hindering the effectiveness of legislative efforts to protect the environment. While Costa Rica took an important step in

1977 by adopting Law 6043, the law's failure to address problems within and outside of its jurisdiction is affecting both human health and the environment in the coastal zone.

However, the national and many local economies depend on maintaining the integrity of the coastal environment as tourists continue to flock to the beaches of Costa Rica. ICZM provides Costa Rica with a flexible framework to strengthen its current coastal management program and links economic and social development policies with environmental protection. In committing itself to important changes, such as those that I have recommended in this paper, Costa Rica can ensure both conservation and sustainable development of Agujitas and other coastal areas.

Appendix 1

Public involvement has been successfully introduced in South Africa's ICZM program through its "Coastal Liaison Exercise". Its broad objectives are:

- To test the public response and susceptibility to the draft policy and objectives for ICZM and to have the various levels of government explain their respective roles in the ICZM process.
- To explain in simple terms the physical and ecological process operating in the coastal zone and the interactions between the various ecological elements and management actions.
- To demonstrate the use of guidelines for coastal land use by means of case studies with which the specific coastal community is familiar.
- To explain the reason for the coastal regulations and emphasize the need for the public to realize that it is in their own interest that they see to the enforcement thereof.
- To explain the coastal structure planning process and to emphasize the need for the public to become involved in order to ensure that their needs and aspirations are adequately reflected.
- To try and foster the need for effective communication between the various levels of government and the public.
- To seek ways in which the public can actively assist with ICZM on an ongoing basis.

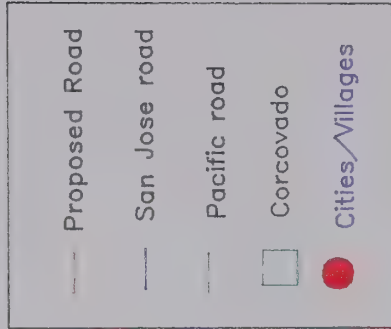
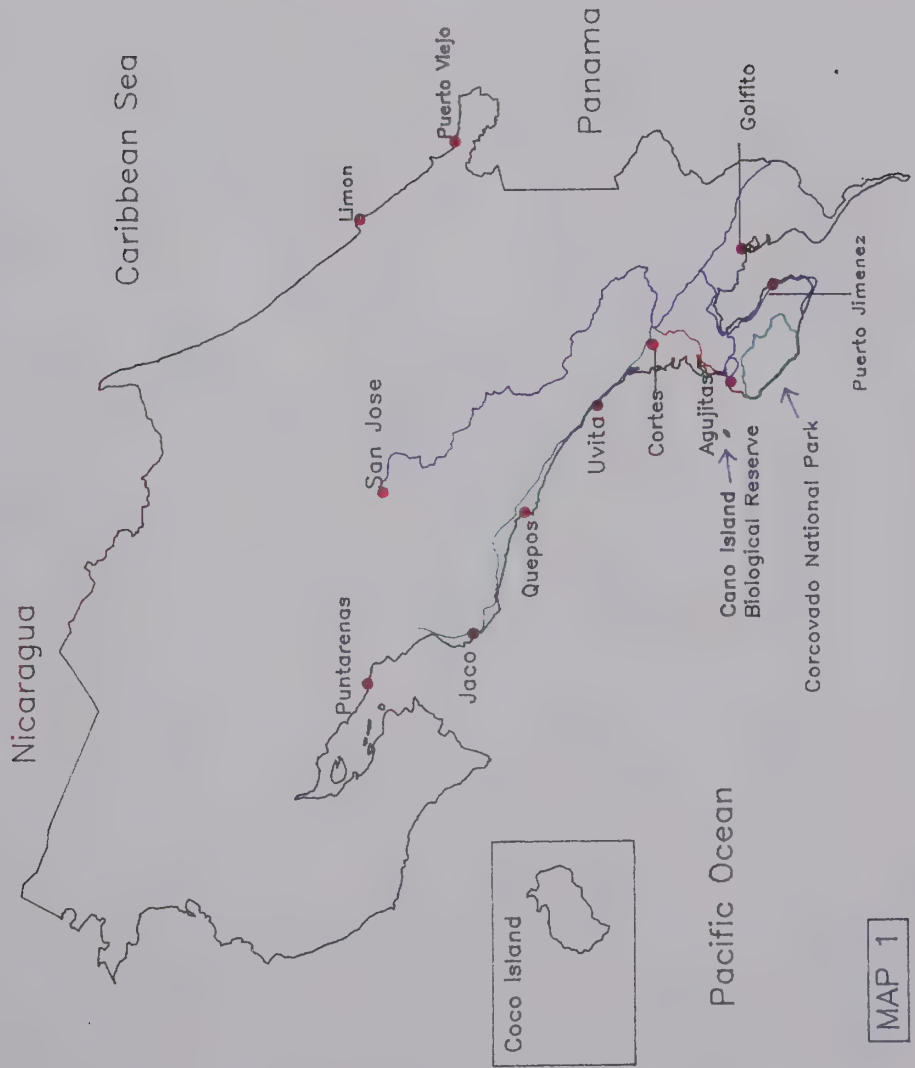
For South Africa, this exercise is now seen as an important forum for communication at all levels and might replace some of the many ineffective committees. It also is seen as a means of bringing the management to the people and providing an opportunity for them to become involved. At the same time, decision makers are beginning to better understand the public concerns (Clark, 1991). These general communication guidelines are valuable in

that they offer countries, such as Costa Rica, rules of thumb that have been effective (or ineffective) and might be applicable to other programs.

Appendix 2

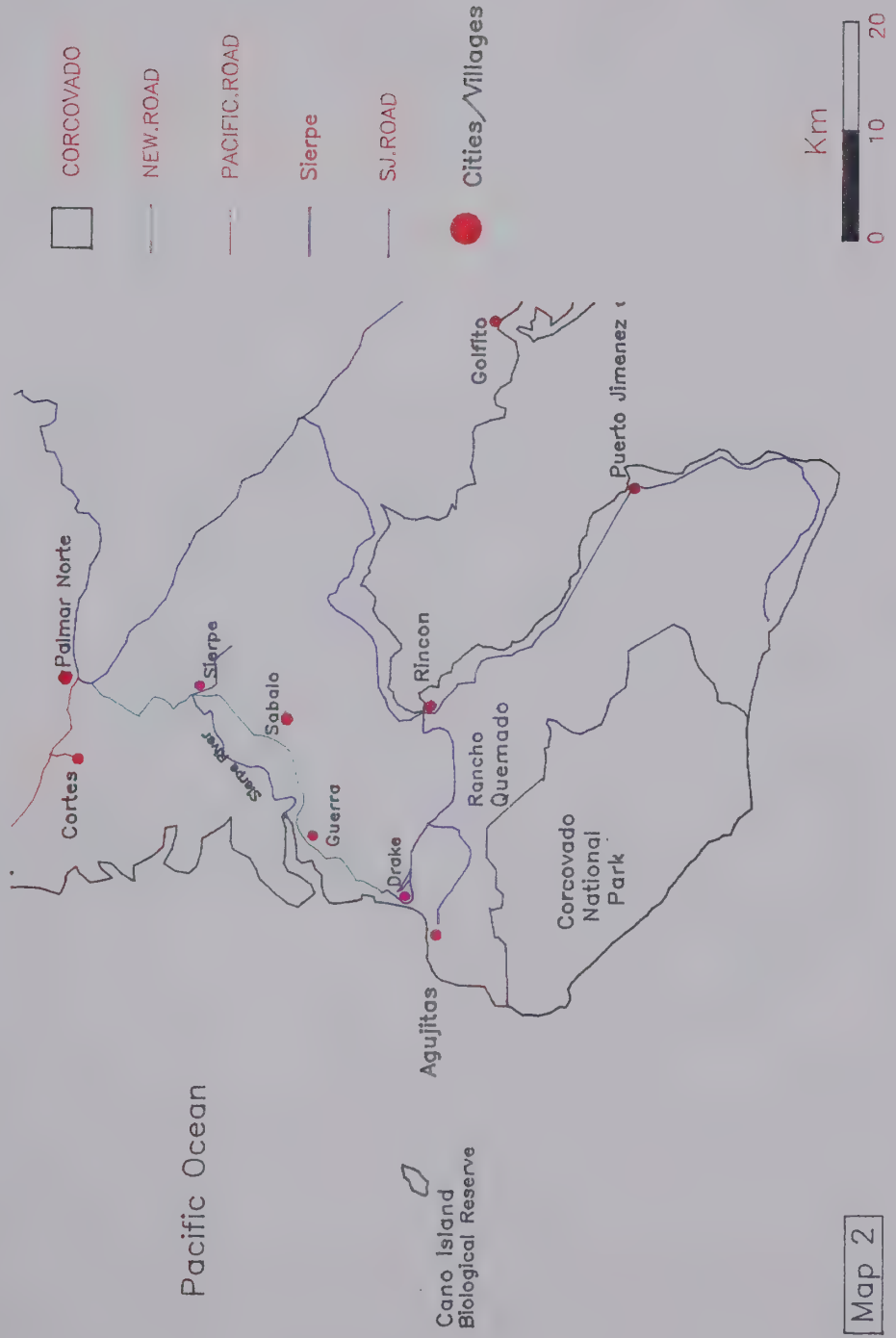
A team carrying out Participatory Rural Appraisal (PRA) in a Kenyan community learned that most people in the village did not trust the Assistant Chief. There was a bad feeling within the village and many previous projects had failed because of deeply held animosity. The PRA team decided to talk with formal and informal leaders in the area about different management models. They decided that the best plan was to organize a committee with the Assistant Chief as advisor. The Chief was part of the action, but the plan was decentralized to allow other groups to initiate and carry out the work assignments. This avoided potential conflict between the Assistant Chief and the community and the projects were carried out as planned (Asamba, 1992).

COSTA RICA

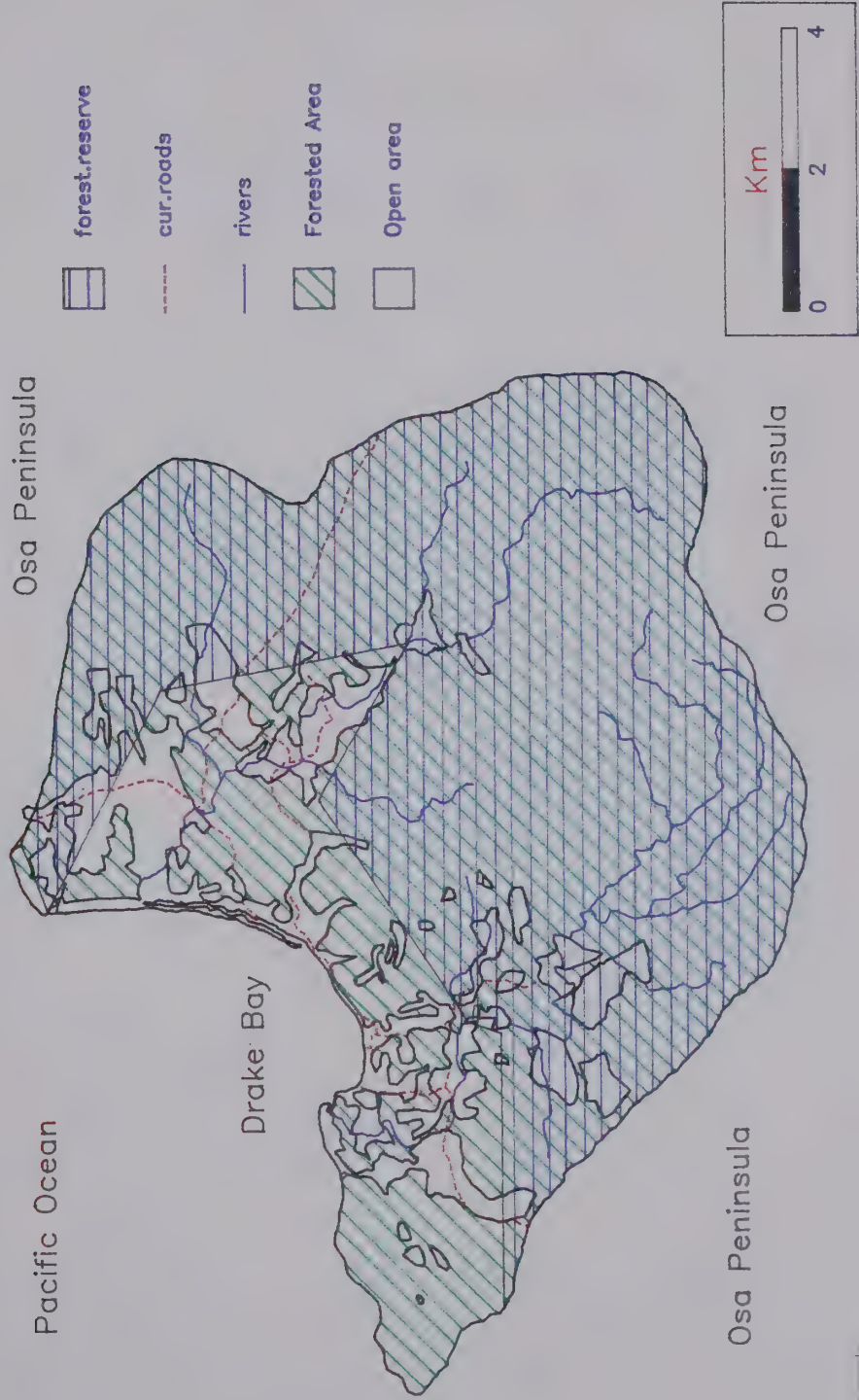


MAP 1

Osa Peninsula, Costa Rica



Agujetas, Costa Rica



Map 3

AGUJITAS, COSTA RICA



List of References

Asamba, Isabella, Richard Ford, Francis Lelo, Elizabeth Odour-Noah, and Lori Wichart, 1992. Implementing PRA: A Handbook to Facilitate Participatory Rural Appraisal. Published with support from the Agency for International Development.

Ausavajitanond, Sompong, and Sirikul Bunpong, 1991. Saving What's Left of Tourism Development at Patong Beach, Phuket, Thailand. Coastal Zone 1991. Proceedings of the 7th Symposium on Coastal and Ocean Management, Long Beach, CA.

Axler, Normand, and David Godschalk, 1977. Carrying Capacity Applications in Growth Management. Prepared for the U.S. Department of Housing and Urban Development, Chapel Hill, North Carolina.

Bauer, Jerry, Bruce Cabarle, Paula Palmer, and Meg Symington, 1992. BOSCOSA: The Program for Forest Management and Conservation on the Osa Peninsula, Costa Rica. A Project Evaluation Report. Prepared for USAID/Costa Rica.

Brandon, Katrina, Lee Hannah, and Michael Wells, 1990. People and Parks: An Analysis of Projects Linking Protected Area Management with Local Communities. Draft Report.

Brower, David, and Daniel S. Carol, 1984. Coastal Zone Management as land Planning. Prepared for the National Planning Association, Washington D.C.

Burbridge, Peter R., John Clark, and Norbert Dankers, 1989. Multiple-Use Assessment for Coastal Management. Coastal Zone 1989. Proceedings from the 6th Symposium on Coastal and Ocean Management, Charleston, SC.

Campanario Conservation Association (CCA), 1991. Buffer Zone Conservation for Sustainable Development of the Osa Peninsula, Northwest Sector, Costa Rica. Proposal submitted to World Wildlife Fund and the Agency for International Development. San Jose, Costa Rica.

CEDARENA, 1992. Interviews with Steven Mack and Franklin Paniagua. San Jose, Costa Rica.

Cernea, Michael M., 1983. A Social Methodology for Community Participation in Local Investments: The Experience of Mexico's PIDER program. World Bank Staff Working Papers No. 598. World Bank, Washington D.C.

Clark, John, 1991. The Status of Integrated Coastal Zone Management: A Global Assessment. Report from workshop in Charleston, SC. Coastal Area Management Planning Network.

Clark, John, 1990. Carrying Capacity: The Limits to Tourism. Prepared for the Congress on Marine Tourism, East-West Conference Center, University of Hawaii, Honolulu.

Clark, John, 1983. Coastal Ecosystem Management. Robert E. Krieger Publishing Company, Malabar, Florida.

Clark University, Egerton University, National Environment Secretariat, and the World Resources Institute, 1991. Participatory Rural Appraisal Handbook: Conducting PRAs in Kenya.

de Kadt, Emanuel, 1979. Tourism: Passport to Development? Published for the World Bank and Unesco. Oxford University Press, New York.

DEPPAT S.A, 1988. Plan de Usos del Suelo: Punta San Jose. Prepared for Marengo Biological Station, San Jose, Costa Rica.

Eadington, William R., and Milton Redman, 1991. Economics and Tourism. Annals of Tourism Research, Volume 18, pp.41-56. Pergamon Press.

Ecotourism Society. 1991. Newsletter. Spring.

Fundacion Neotropica, 1992. Evaluacion Ecologia Rapida: Peninsula de Osa. Financed by World Wildlife Fund. San Jose, Costa Rica.

Fundacion Neotropica, 1991. Plan de Manejo: La Reserva Forestal del Golfo Dulce. San Jose, Costa Rica.

Godschalk, David, 1971. Participation, Planning, and Exchange in Old and New Communities: A Collaborative Approach. Prepared for the Center for Urban and Regional Studies, University of North Carolina, Chapel Hill.

Grober, Linda, and Alexander Fernald, 1992. Interviewed in Durham, North Carolina.

Hershman, Marc J., Scott T. McCreary, and Jens C. Sorenson, 1984. Institutional Arrangements for Management of Coastal Resources. Prepared for the National Park Service, U.S. Department of the Interior, and the U.S. Agency for International Development. Renewable Resources Information Series, Coastal Management Publication No.1.

Inskip, Edward, 1987. Environmental Planning for Tourism. Annals of Tourism Research, Volume 14, pp.118-135. Pergamon Journals Ltd.

Instituto Costarricense de Turismo (ICT), 1991. Manual Operativo para la Elaboracion de Planes Reguladores en la Zona Maritimo Terrestre. San Jose, Costa Rica.

Interviews, 1992. Interviews in Agujitas, Costa Rica with Don Carmen, Pedro, Thelmo, Tom (tourist), Benita, Emiliano, Rob, Herb, tourists. Interviews in Puerto Viejo, Costa Rica with Javier, Clinton, Edwin. Interview in San Jose, Costa Rica, Ronald Esquivel of DEPPAT S.A.

Interviews, 1993. Interviews in Agujitas, Costa Rica with Don Carmen, Pedro, Rafael, Marta, store owner, Sergio, Claire (tourist), Santiago, Joseanna, Isabella, Omar.

Kettering, Merlyn, Terry D. Schmidt, and Jerry M. Silverman, 1986. Action Planning Workshops for Development Management. World Bank Technical Paper No. 56. World Bank, Washinton D.C.

Lea, John, 1988. Tourism and Development in the Third World. Routledge, New York.

- Lee, David, 1990. Tortuguero: A Comparative Study on the Impacts of a New Road. Draft of Master's Project, Duke University, NC.
- Mateo, Dr. Carlos A. Quesada, 1990. Estrategia de Conservacion para el Desarrollo Sostenible de Costa Rica. Ministry of Natural Resources, Energy and Mines. San Jose, Costa Rica.
- Mathieson, Alister, and Geoffrey Wall, 1982. Tourism: Economic, Physical, and Social Impacts. Longman Group Limited, New York.
- McGoodwin, James R., 1986. The Tourism-Impact Syndrome in Developing Coastal Communities: A Mexican Case. Coastal Zone Management Journal, Volume 14, Crane, Russak & Co., Inc.
- Mitchell, James K., 1986. Coastal Management Since 1980: The U.S. Experience and its Relevance to Other Countries. Coastal Management. University of Chicago.
- Murphy, Peter E., 1985. Tourism: A Community Approach. Methuen, Inc., New York.
- Odum, William, 1976. Ecological Guidelines for Tropical Coastal Development. Published with the support of World Wildlife Fund, International Union for Conservation of Nature and Natural Resources, Morges, Switzerland.
- Place, Susan E., 1991. Nature Tourism and Rural Development in Tortuguero. Annals of Tourism Research, Volume 18, pp. 186-201. Pergamon Press.
- Smith, Russell Arthur, 1992. Conflicting Trends of Beach Resort Development: A Malaysian Case. Coastal Management, Volume 20, pp. 167-187. Taylor and Francis.
- Sorenson, Jens, 1990. An Assessment of Costa Rica's Coastal Management Program. Coastal Management, Volume 18. pp.37-63. Taylor and Francis.
- Tropical Science Center, 1982. Costa Rica: Country Environmental Profile. A Field Study. U.S. AID, San Jose, Costa Rica.
- Tropical Science Center, 1992. Informe Sobre el Mapa de Ordenamiento Territorial de la Peninsula de Osa. Prepared for Fundacion Neotropica and the Ministry of Natural Resources, Energy and Mines. San Jose, Costa Rica.
- United States Agency for International Development (USAID), 1992. The Green Book: An Environmental Policy Source Book. Draft Report. Regional Environmental and Natural Resources Project (RENARM).
- United Nations Department of International Economic and Social Affairs, 1982. Coastal Area Management and Development. Pergamon Press, New York.
- Urban Land Institute, 1978. Management and Control of Growth: Techniques in Application. The Urban Land Institute, Washinton D.C.
- Wessels, Astrid, 1992. Conservation Without Evictions: The Search for Social and Ecological Justice on Costa Rica's Osa Peninsula. Brown University.

